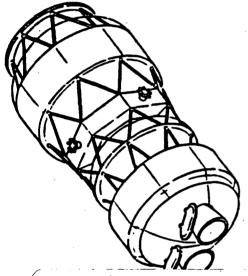
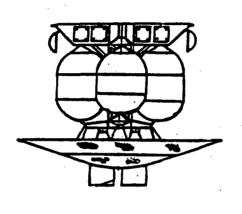
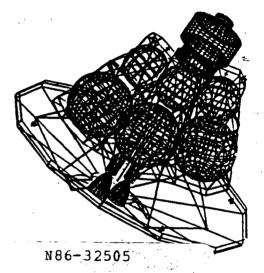
Boeing Aerospace Operations

ORBITAL RANSEER VEHICLE Launehloperations Study







(NASA-CR-17.9766) ORBITAL TRANSFER VEHICLE LAUNCH OPERATIONS STUDY. PROCESSING FLOWS. V VOLUME 3 Final Report (Boeing Aerospace Co.) 230 p CSCL 22D

Unclas G3/14 44620

PROCESSING FLOWS

VOLUME 3 OF 5

MARCH 7, 1986

FINAL REPORT

KENNEDY SPACE CENTER NAS10-11165

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OTV PROCESSING FLOWS

and

REQUIREMENTS IDENTIFICATION SHEETS (RIS's)

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The ground based flow was developed first because it could, initially, follow the lines of current processing practices at the KSC launch site. The space based flow was laid out in a similar fashion using the same primary task numbers to facilitate a direct correlation between space based and ground based activities. Several tasks are different, of course, either because of the zero "G" environment or because of the nature of the structure of the Space Station itself. Large cranes and tugs, for example, serve no purpose in space but an MRMS (Mobile Remote Manipulating System) will be used extensively during recovery, deployment, or moves at the Station itself. Another example of the cause for differences between ground and space based flows would be in the propellant tanking activity. The propellant storage area tanks are in the basic Station structure so the vehicle is loaded with cryos before it it moved to the launch site rather than after, as is the normal operation on the ground.

If a major task box is not used, that task box and number are just left out. If a new SBOTV task is added, it is associated with an existing major task box and identified as a new subtask by using a new decimal number within the block where it is added. As indicated above, the tasks may not run in the same sequence as for the GBOTV so the major task numbers for the SBOTV flow may not be sequential nor are all the GBOTV tasks used.

These facts alone lead to some elemental test optimization for the GBOTV. If the function is not used for the SBOTV then one must justify the addition of that item for the GBOTV or else delete it. In this fashion, the accomplishment of the necessities of Space processing can be first performed on the ground -- and be debugged in a more "test crew friendly" environment before being committed to space operations.

The flows were reviewed in detail and several potential candidates were identified in this manner for either deletion or else as items that could be deleted after first use where system integrity; eg, the cryo load test; and/or system compatibility; eg, the Cite test; had been satisfactorily performed and demonstrated. These items were identified as such on the flows in the Appendices. Additional savings may be available as a result of changes in test practices or as a result of the specific hardware in use at the time actual operations start. One should expect several iterations of these flows will be required before a final flow is evolved and approved. Whatever the flow configuration is, it must make: 1) a successful Space Based Operation possible, 2) provide for the transition of those needs to the Ground Based Operation as a set of basic requirements, and 3) provide for the orderly transition of those successfully demonstrated operations from Ground Based to Space Based Operations.

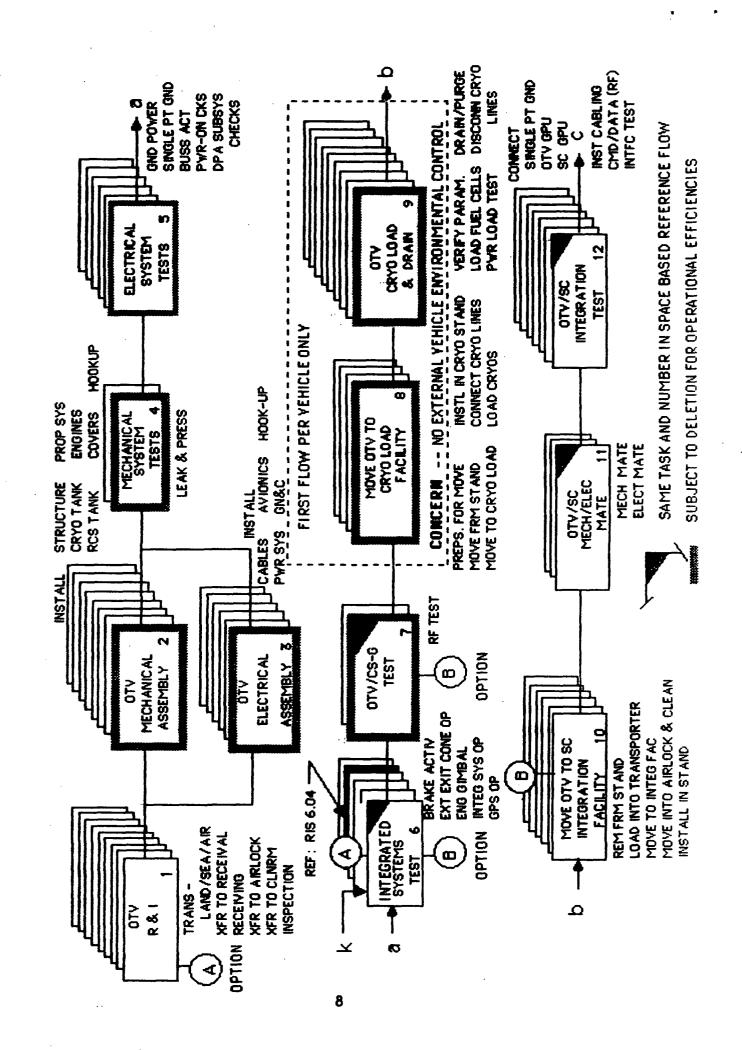
These two sets of analyses -- Flows and RIS's - for the GBOTV and for the SBOTV-are the primary source of information for the rest of the KSC OTV Launch
Operations Study. Work to identify KSC facility requirements for the OTV Program,
simplify or automate either flow thru the application of automation technology,
revise test practices and identify crew sizes or skills used these flows as the
primary point of departure from current operations and practices. Analyses results
were documented by revising the appropriate RIS page. The latest results of those
analyses are the material included in the Appendices to this document.

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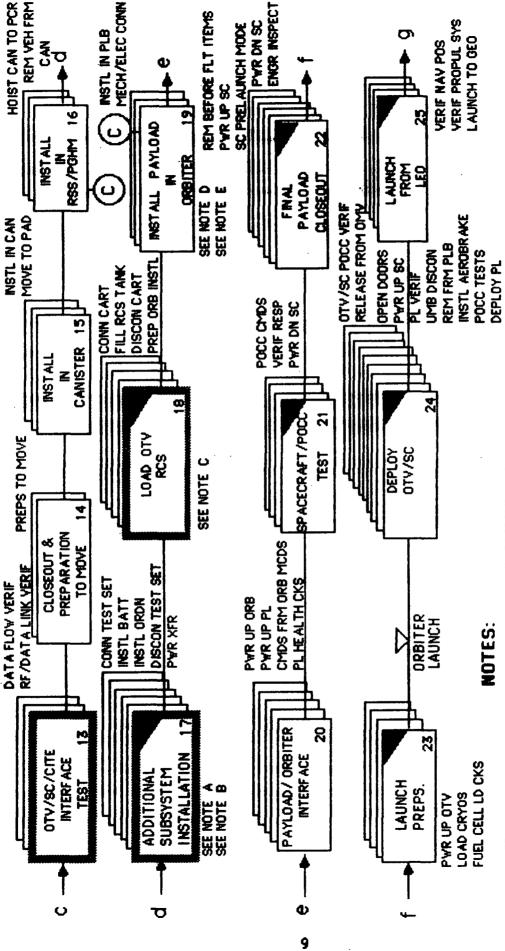
APPENDIX A

GROUND BASED ORBITAL TRANSFER VEHICLE FLOW

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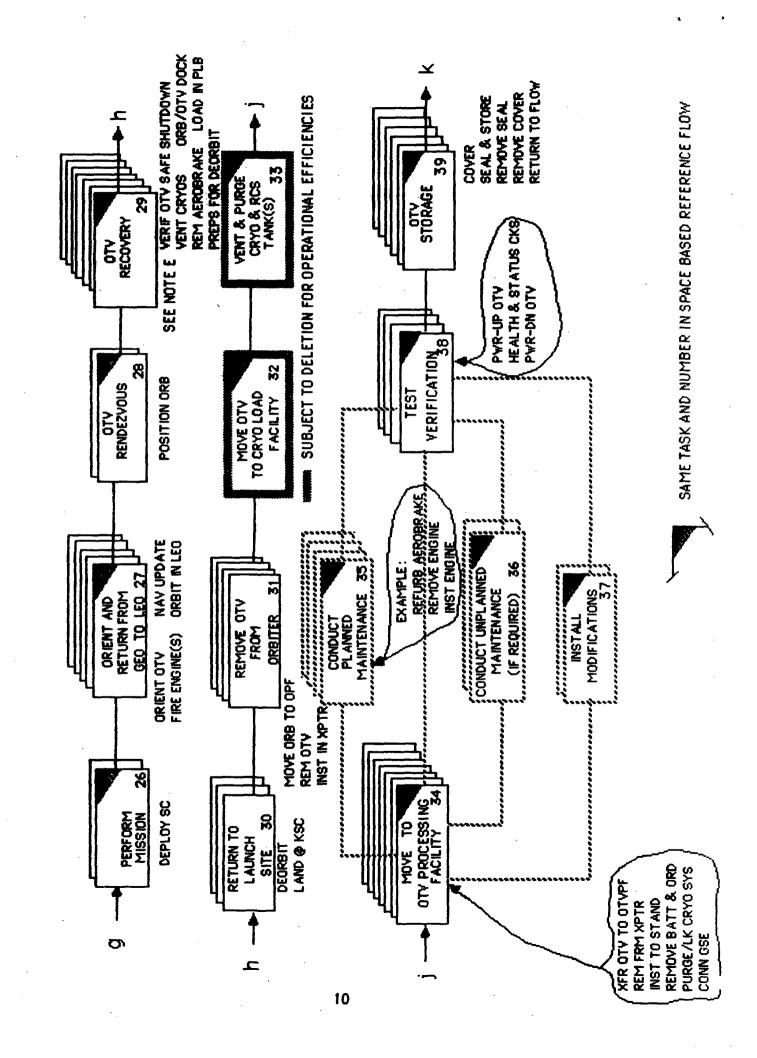
SHOULD BE -- IF THE FUNCTION IS REQUIRED, IT SHOULD BE ACCOMPLISHED OFFLINE. INSTALLATION OF EITHER OR BOTH COULD OCCUR ELSEWHERE. DESIGN OBJECTIVE BATTERY AND ORDNANCE -- REQUIREMENTS AND TYPE PRESENTLY UNDEFINED. ÷

. SC PROCESSING REQUIREMENTS IN PCR COULD INFLUENCE TOTAL FLOW TIME.

RCS REQUIREMENTS ARE NOT FIRM. DESIGN OBJECTIVE SHOULD BE TO ACCOMPLISH OFFLINE.

DESIGN OBJECTIVE SHOULD BE TO ELIMINATE ANY OTY ACCESS REQUIREMENTS IN PLB AFTER PLB INSERTION OTV REENTRY BRAKING DEVICE PROCESSING -- TBD

SAME TASK AND NUMBER IN SPACE BASED REFERENCE FLOW



(

APPENDIX B

GROUND BASED RESOURCE IDENTIFICATION SHEETS

GROUND BASE DETAILED RESOURCE IDENTIFICATION SHEET DESCRIPTION

The following Ground Based Resource Identification Sheets (RIS's), have defined the OTV processing flow in 39 separate tasks. These tasks (1 thru 39) are detailed further to provide specific manpower and facility requirements by individual subtasks of the OTV processing flow.

The RIS for each subtask is divided into 3 sections; Personnel, Facilities, and Equipment Resource Requirements.

The Personnel section details manpower requirements at either the vehicle location or the control station. Along with the manning requirements is the serial time to complete the subtask and the computed total manhours. The Primary and Secondary keys associated with the Automation Technology Knowledge Base (ATKB), have not been keyed at this time.

The Detailed Facility Resources section indicates all the facility requirements for the specific subtask.

The Detailed Equipment Resources section indicates the additional special equipment required to perform a specific subtask.

A legend on the bottom of each sheet provides a description of the data as input to the analysis system. All the fields defined are self explanatory with the exception of those marked (*).

The Ground Based RIS's are presented in numerical order which coincides with the vehicle processing flow.

RECEIVING AND INSPECTION Task No: Subtask No: < 1.0100> Description: <TRANSPORTATION LAND Hozord Level(*): 1 None Activity: TRANSPORT THE OTV TO KSC VIA LAND TRANSPORTATION Personnei: Control Station Vehicle Payload Specialist(s) (0) Ø) 0) ø) Engineering 2) 0) Shop Inspector ΘÌ Other Sub Total-3) Total-Total Manhours (288.0) Serial Time To Complete: 5760 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] 0 0 0 Ton Air Lock: **0** Ft.Hook Height W/H][ft] Doors: 0 0 High Bay: 0 [W/D/H][ft] 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleantiness: ØK E.C.S: Humidity: Temperature: 0 +/- 0 % 0 +/-Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): N OIS: NA Personnel Airlock: NA Grounding: Y **Explosion Proof: NA** Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable TD: To Be Determined or 4: Facility Clear

3

```
RECEIVING AND INSPECTION
         Task No:
Subtask No: < 1.0200> Description: <TRANSPORTATION Hazard Level(*): 1 None Activity: TRANSPORT THE OTV TO KSC VIA BARGE TRANSPORTATION
                                  Description: <TRANSPORTATION BARGE
Personnei:
                     Vehicle
                                                      Control Station
              Payload Specialist(s)
                                       0)
                                                               0)
                                                               0
                                        0)
              Engineering
                                      0
              Shop
                                                               0
              Inspector
              Other
                Sub Total-
                                                3)-
                                                           Total-
Serial Time To Complete: 5760 min
                                                   Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                     Detailed Facility Resources
                  Physical Size:
                                                          Crane Capacity:
          Air Lock:
                                 [W/D/H][ft]
                                                    0 Ton
                                                               0 Ft. Hook Height
                       ø
             Doors:
                                  [W/H][ft
          High Boy:
                               0 [W/D/H][ft]
                                                    0 Ton
                                                               9 Ft. Hook Height
Standard Commerical Power: NA
                                     Instrumentation Power [Uninterrupted]: NA
Cleanliness:
                                     E.C.S: Humidity:
                0K
                                                              Temperature:
                                           0 +/- 0 %
                                                                     0 +/-
                                                                             0 F
Closed Circuit Television: NA
                                     Power Cutoff: NA
                                                              Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                    Helium Supply: NA
                                                              Shop Air: NA
Fire Protection/Deluge(*): A
                                     Shower/Eye Wash: NA
                                                              Vacuum: NA
Lightning Protection: NA
                                     Potable Water: NA
                                                              Paging: NA
Commercial Telephone: NA
                                     RF System(*): N
                                                              OIS: NA
Personnel Airlock: NA
                                    Grounding: Y
                                                              Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                              Slings: NA
                                                      OTV Adapter: NA
Breakout Boxes: NA
                              Adapter Cables: NA
                                                      Ground Power Unit: NA
Air Pollet: NA
                              Work Stands: NA
                                                      Special Hoisting Equip: NA
NASA Conister: NA
                              OTV Conister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                   RF System= A: S Band & C Band
                       or B: deluge
                                                           or B: Ku Band
                       or C: both
                                                           or C: both
                       or N: none
                                                           or N: none
          Hazard Level:= 1: None
                                                     Others:= Y: Yes
                       or 2: Local Clear
                                                              N: No
                       or 3: Area Clear
                                                             NA: Not Applicable
                       or 4: Facility Clear
                                                             TD: To Be Determined
```

```
Task No:
                            RECEIVING AND INSPECTION
Subtask No: < 1.0300>
                                 Description: <TRANSPORTATION AIR
Hozord Level(*): 1 None
Activity: TRANSPORT THE OTV TO KSC VIA AIR TRANSPORTATION
Personnel:
                                                     Control Station
                     Vehicle
             Payload Specialist(s)
                                      0)
                                                             0)
                                                             0
             Engineering
                                      0
                                                             0
             Shop
                                      1)
              Inspector
                                      1)
                                                             0
                                      0)
              Other
                Sub Total-
                                               2)
                                                         Total-
Serial Time To Complete: 480 min
                                                 Total Manhours (
                                                                    16.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                        Crane Capacity:
                                [W/D/H][ft]
         Air Lock:
                      ø
                          0
                                                  Ø Ton
                                                             0 Ft.Hook Height
                              0
                          0
            Doors:
                      Ø
                                 [W/H][ft]
         High Bay:
                          A
                              0 [W/D/H][ft]
                                                  0 Ton
                                                              0 Ft.Hook Height
Standard Commerical Power: NA
                                   Instrumentation Power [Uninterrupted]: NA
Cleanliness:
                                   E.C.S: Humidity:
                                                             Temperature:
                                          0 +/-
                                                  0 %
                                                                   0 +/-
                                   Power Cutoff: NA
Closed Circuit Television: NA
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: NA
                                   Potable Water: NA
                                                            Paging: NA
Commercial Telephone: NA
                                                            OIS: NA
                                   RF System(*): N
Personnel Airlock: NA
                                   Grounding: Y
                                                             Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (+) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                          or C: both
                      or N: none
                                                          or N: none
          Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                            NA: Not Applicable
```

TD: To Be Determined

or 4: Facility Clear

Task No: 1 RECEIV	ING AND INSPECTION				
Subtask No: < 1.0400> De Hazard Level(*): 1 None Activity: REMOVE OTV FROM TRANSPOR	escription: <transfer to<br="">RTER AND PREPARE FOR TRAI</transfer>				
Personnel:					
Vehicle Payload Specialist(s Engineering Shop Inspector Other Sub Total		Station (0) (0) (0) (0)			
Serial Time To Complete: 480 min	io Total Manh	ours (64.0)			
Automation Need: (Primary Key)					
Automation Secondary Key(s) , , ,					
	, ,	,			
Detailed Facility Resources					
Doors: 0 0 [W	Cra /D/H][ft] 0 Ton /H][ft] /D/H][ft] 0 Ton	ne Capacity: 0 Ft.Hook Height 0 Ft.Hook Height			
Standard Commerical Power: Y	Instrumentation Power [Uninterrupted]: NA			
Cleanliness: 100K	E.C.S: Humidity:	Temperature:			
Closed Circuit Television: NA	50 +/- 5 % Power Cutoff: NA	70 +/- 5 F Facility GN2: NA			
Fuel/Oxidizer Disposal: N	Helium Supply: NA	Shop Air: NA			
Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA					
Lightning Protection: Y	Potable Water: NA	Paging: Y			
Commerical Telephone: Y	RF System(*): N	OIS: NA			
Personnel Airlock: Y	Grounding: Y	Explosion Proof: NA			
Detailed Equipment Resources					
Special Tool Kit: NA Sling	s: NA OTV Ada	pter: NA			
Breakout Boxes: NA Adapt	er Cables: NA Ground	Power Unit: NA			
Air Pallet: NA Work	Stands: NA Special	Hoisting Equip: NA			
NASA Canister: NA OTV C	anister: NA				
(*) Legend For Data Input					
Fire Protection/Deluge= A: fire p or B: deluge or C: both or N: none	or or	A: S Band & C Band B: Ku Band C: both N: none			
Hazard Level:= 1: None or 2: Local or 3: Area C or 4: Facili	lear	Y: Yes N: No NA: Not Applicable TD: To Be Determined			

RECEIVING AND INSPECTION Task No: Subtask No: < 1.0500> Hazard Level(+): 1 None Description: <RECEIVING Activity: RECIÉVE OTV/TRANSPORTER AND INSPECT Personnel: **Control Station** Vehicle Payload Specialist(s) 0) ø) Engineering 2) Shop 0) 0) Inspector \ es Other Sub Total-Total-Serial Time To Complete: 480 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] Air Lock: 0 0 0 Ton Ø Ft. Hook Height 0 Doors: 0 0 [W/H][ft] 0 [W/D/H][ft] High Bay: 0 Ton 0 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-5 F Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: Y Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

RECEIVING AND INSPECTION Task No: Description: <XFER OTV TO OTVPF AIRLOCK Subtask No: < 1.0600> Hazard Level (*): 1 None Activity: CLEAN TRANSPORTER-REMOVE/UNPACK OTV IN OTVPF AIRLOCK Personnel: **Control Station** Vehicle Payload Specialist(s) 0) Ð) 2) 5) 1) 0) Engineering 0) Shop 0 Inspector Ìέ Other Sub Total-8)-Total-Total Manhours (32.0) Serial Time To Complete: 240 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: 40 40 50 [W/D/H][ft]
Doors: 0 0 [W/H][ft] 10 Ton 45 Ft. Hook Height 0 [W/D/H][ft] High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: Y Fire Protection/Deluge(+): A Shower/Eye Wash: NA Vacuum: Y Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
Task No:
                           RECEIVING AND INSPECTION
                                Description: <TRANSFER OTV TO CLEAN ROOM
Subtask No: < 1.0700>
Hazard Level(+): 1 None
Activity: MOVE OTV INTO CLEAN ROOM HIGH BAY
Personnel:
                    Vehicle
                                                    Control Station
             Payload Specialist(s)
                                     0)
                                                            0)
             Engineering
                                      1)
                                     5)
                                                            0)
             Shop
                                                            øί
             Inspector
             Other
               Sub Total-
                                             8)
                                                        Total-
Serial Time To Complete: 480 min
                                                Total Manhours (
                                                                  64.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                       Crane Capacity:
                    0 0 0 [W/D/H][ft]
35 45 [W/H][ft]
                                                 0 Ton
         Air Lock:
                                                            9 Ft. Hook Height
            Doors:
         High Bay: 70 100 85 [W/D/H][ft]
                                                           70 Ft. Hook Height
                                                20 Ton
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: NA
                                   E.C.S: Humidity:
Cleanliness: 100K
                                                           Temperature:
                                        50 +/- 5 %
                                                                70 +/-
                                                                          5 F
Closed Circuit Television: NA
                                   Power Cutoff: NA
                                                           Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                           Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                           Vacuum: NA
Lightning Protection: Y
                                   Potable Water: Y
                                                           Paging: Y
Commercial Telephone: Y
                                   RF System(*): N
                                                           OIS: NA
Personnel Airlock: Y
                                   Grounding: Y
                                                           Explosion Proof: NA
                  Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                   OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                   Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                   Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                 (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                RF System= A: S Band & C Band
                     or B: deluge
                                                        or B: Ku Band
                     or C: both
                                                        or C: both
                      or N: none
                                                        or N: none
         Hazard Level:= 1: None
                                                  Others:= Y: Yes
                      or 2: Local Clear
                                                           N: No
                     or 3: Area Clear
                                                          NA: Not Applicable
                      or 4: Facility Clear
                                                          TD: To Be Determined
```

RECEIVING AND INSPECTION Task No: Subtask No: < 1.0800> Hazard Level(*): 1 None Description: <OTV INSPECTION > Activity: INSPECT AND INVENTORY OTV HARDWARE Personnel: Vehicle **Control Station** Payload Specialist(s) 0) 2) 3) Engineering 0) Shop 0) ě١ Inspector 1) Other 0) Sub Total-6)-6) Total-Serial Time To Complete: 480 min Total Manhours (48.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: 0 0 0 [W/D/H][ft]
Doors: 0 0 [W/H][ft]
High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft. Hook Height 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/--5 F Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: OTV MECHANICAL ASSEMBLY Subtask No: < 2.0100> Description: <INSTALL ASSEMBLY STRUCTURE > Hazard Level(*): 2 Local Clear Activity: ATTACH SLING TO ASSEMBLY STRUCTURE—ATTACH SLING TO O/H CRANE—REMOVE HOLDDOWN HARDWARE—REMOVE FROM PALLET INSPECT GUIDEPINS AND ATTACH POINTS Personnel: Control Station Vehicle Payload Specialist(s) (Ø) 2) 5) 2) 0) Engineering 0 Shop ΘŚ Inspector Other 9). Sub Total-Total-Serial Time To Complete: 960 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Air Lock: 0 Doors: a [W/H][f: High Bay: 70 100 85 [W/D/H][ft] 20 Ton 70 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-70 +/-5 F Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y **Explosion Proof: NA** Detailed Equipment Resources Special Tool Kit: Y Slings: Y OTV Adapter: NA **Breakout Boxes: NA** Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: Y NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
Task No:
                   2
                            MECHANICAL ASSEMBLY
                                 Description: <INSTALL CRYO TANK SET
Subtask No: < 2.0200>
Hazard Level(+): 2 Local Clear
Activity: ATTACH SLING TO TANK SET LIFT POINTS-LIFT FROM PALLET-INSPECT
DISCONNECT GUIDEPINS AND STRUCTURE ATTACH POINTS-LIFT INTO POSITION, SECURE, SAFE
Personnel:
                                                    Control Station
                    Vehicle
             Payload Specialist(s) (
                                      A)
                                                            0
                                      2)
5)
2)
0)
             Engineering
                                                            0
             Shop
                                                            Ø.
                                                            0)
             Inspector
             Other
               Sub Total-
                                              9).
                                                         Total.
Serial Time To Complete: 720 min
                                                Total Manhours (
                                                                  108.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                       Crane Capacity:
                                [W/D/H][ft]
[W/H][ft]
         Air Lock:
                         Ø
                                                  0 Ton
                                                             0 Ft. Hook Height
                     0
                              Ø
                          a
            Doors:
                     A
         High Bay: 70 100 85 [W/D/H][ft]
                                                20 Ton
                                                            70 Ft. Hook Height
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                   E.C.S: Humidity:
                                                            Temperature:
                                        50 +/- 5 %
                                                                 70 +/-
                                                                          5 F
Closed Circuit Television: NA
                                   Power Cutoff: NA
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                            Paging: Y
Commerical Telephone: Y
                                   RF System(*): N
                                                            OIS: NA
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: NA
                  Detailed Equipment Resources
Special Tool Kit: Y
                                                    OTV Adapter: Y
                             Slings: Y
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: Y
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
                                                 RF System= A: S Band & C Band
Fire Protection/Deluge= A: fire protection
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

```
2
                            MECHANICAL ASSEMBLY
        Task No:
Subtask No: < (2.0300>
                                 Description: <INSTALL RCS TANK SET
Hazard Level(*): 2 Local Clear
Activity: IMPLEMENT SAFTY PROCEDURE-REMOVE TANK SET FROM SHIPPER-INSPECT-REMOVE
PROTECTIVE COVER/DEVICES-INSTALL IN OTV ASSEMBLY STRUCTURE. SECURE. SAFE
Personnel:
                                                     Control Station
                    Vehicle
             Payload-Specialist(s) (
                                      0)
                                                             0)
                                      2) 5) 2) 0)
                                                             ø)
             Engineering
             Shop
                                                             0
                                                             9)
             Inspector
             Other
               Sub Total-
                                               9)
                                                         Total:
Serial Time To Complete: 360 min
                                                 Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                                                        Crane Capacity:
                  Physical Size:
                              0 [W/D/H][ft]
                      0 0
                                                  0 Ton
         Air Lock:
                                                             0 Ft.Hook Height
            Doors:
                      Ø
                          0
                                 [W/H][ft]
                    70 100 85 [W/D/H][ft]
         High Bay:
                                                 20 Ton
                                                             70 Ft. Hook Height
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                             Temperature:
                                         50 +/- 5 %
                                                                  70 +/-
Closed Circuit Television: NA
                                    Power Cutoff: NA
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                    Helium Supply: NA
                                                             Shop Air: Y
Fire Protection/Deluge(*): A
                                    Shower/Eye Wash: NA
                                                             Vacuum: NA
Lightning Protection: Y
                                    Potable Water: NA
                                                             Paging: Y
Commercial Telephone: Y
                                    RF System(*): N
                                                             OIS: NA
Personnel Airlock: Y
                                    Grounding: Y
                                                             Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: Y
                                                    OTV Adapter: Y
                             Slings: Y
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: Y
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                          or B: Ku Band
                      or C: both
                                                          or C: both
                      or N: none
                                                          or N: none
          Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                             N: No
                      or 3: Area Clear
                                                            NA: Not Applicable
                      or 4: Facility Clear
                                                            TD: To Be Determined
```

Task No: 2 MECH	NNICAL ASSEMBLY					
Subtask No: < 2.0400> Description: <instl &="" 2="" clear<="" contrls="" hazard="" level(*):="" local="" plmb="" propl="" sys="" td=""></instl>						
Activity: ATTACH SLING TO LIFT POINTS, ATTACH TO O/H HARDWARE, SPECIAL W/S, INSPECT GUIDEPINS AND ASSY STRUCT.—ATTACH POINTS. LIFT TO POSITION, ALIGN GUIDE PINS Personnel:						
Vehicle Payload Specialist		1 Station (0)				
Engineering Shop	(2)	(0) (0)				
Inspector Other	(2)	(0)				
Sub Total	(9)	(0) tal(9)				
Serial Time To Complete: 480 m						
Automation Need: (Primary Key)	·					
Automation Secondary Key(s)		•				
		,				
Detailed Facility Resources						
Physical Size: Air Lock: 0 0 0 Doors: 0 0	Cra [W/D/H][ft] 0 Ton [W/H][ft]	ne Capacity: 0 Ft.Hook Height				
	[W/D/H][ft] 20 Ton	70 Ft.Hook Height				
Standard Commerical Power: Y	Instrumentation Power [Uninterrupted]: NA				
Cleanliness: 100K	E.C.S: Humidity: 50 +/- 5 %	Temperature: 70 +/- 5 F				
Closed Circuit Television: NA	Power Cutoff: NA	Facility GN2: NA				
Fuel/Oxidizer Disposal: N	Helium Supply: NA	Shop Air: Y				
Fire Protection/Deluge(*): A	Shower/Eye Wash: NA	Vacuum: NA				
Lightning Protection: Y	Potable Water: NA	Paging: Y				
Commercial Telephone: Y	RF System(*): N	OIS: NA				
Personnel Airlock: Y	Grounding: Y	Explosion Proof: NA				
Detailed Equipment Resources						
Special Tool Kit: Y	ngs: Y OTV Ado	pter: Y				
Breakout Boxes: NA Ada	pter Cables: NA Ground	Power Unit: NA				
Air Pallet: NA Wor	k Stands: Y Special	Hoisting Equip: Y				
NASA Canister: NA OTV	Canister: NA					
(*) Legend For Data Input						
Fire Protection/Deluge= A: fire or B: delu	protection RF System=	A: S Band & C Band B: Ku Band				
or C: both	or or	C: both N: none				
Hazard Level:= 1: None or 2: Loca	l Clear	N: No				
or 3: Area or 4: Faci	lity Clear	NA: Not Applicable TD: To Be Determined				

```
MECHANICAL ASSEMBLY
        Task No: 2
Subtask No: < 2.0500> Description: <INSTALL RCS/ENGINES Hazard Level(*): 2 Local Clear Activity: INSTALL RCS NOZZLES AND ENGINES PER INSTALLATION PROCEDURES
Personnel:
                     Vehicle
                                                       Control Station
              Payload Specialist(s)
                                        D)
                                                                0)
                                        2)
              Engineering
                                                                0)
                                        5)
              Shop
                                        2)
                                                                05
              Inspector
              Other
                Sub Total-
                                             -( 9)-
                                                            Total-
Serial Time To Complete: 480 min
                                                   Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                     Detailed Facility Resources
                  Physical Size:
                                                           Crane Capacity:
                               0 [W/D/H][ft]
                                                    0 Ton
                           0
          Air Lock:
                       0
                                                                0 Ft.Hook Height
                       0
                           0
             Doors:
                                   `W/H][ft
          High Bay:
                      70 100 85 [W/D/H][ft]
                                                   20 Ton
                                                               70 Ft. Hook Height
Standard Commercial Power: Y
                                     Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                     E.C.S: Humidity:
                                                               Temperature:
                                          50 +/- 5 %
                                                                    70 +/-
                                                                              5 F
Closed Circuit Television: NA
                                     Power Cutoff: NA
                                                               Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                     Helium Supply: NA
                                                               Shop Air: Y
Fire Protection/Deluge(*): A
                                     Shower/Eye Wash: NA
                                                               Vacuum: NA
                                     Potable Water: NA
Lightning Protection: Y
                                                               Paging: Y
Commercial Telephone: Y
                                     RF System(*): N
                                                               OIS: NA
Personnel Airlock: Y
                                     Grounding: Y
                                                               Explosion Proof: NA
                    Detailed Equipment Resources
Special Tool Kit: Y
                               Slings: Y
                                                      OTV Adapter: Y
Breakout Boxes: NA
                               Adapter Cables: NA
                                                      Ground Power Unit: NA
Air Pallet: NA
                               Work Stands: Y
                                                      Special Hoisting Equip: Y
NASA Canister: NA
                               OTV Canister: NA
                   (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                   RF System= A: S Band & C Band
                       or B: deluge
                                                            or B: Ku Band
                       or C: both
                                                            or C: both
                       or N: none
                                                            or N: none
                                                     Others:= Y: Yes
          Hazard Level:= 1: None
                       or 2: Local Clear
                                                               N: No
                       or 3: Area Clear
                                                              NA: Not Applicable
                       or 4: Facility Clear
                                                              TD: To Be Determined
```

MECHANICAL ASSEMBLY Task No: 2 Subtask No: < 2.0600> Hazard Level(*): 1 None Description: <INSTALL RCS NOZZLE COVERS Activity: INSTALL PROTECTIVE COVERS ON RCS NOZZLES Personnel: **Control Station** Vehicle Payload Specialist(s) Engineering 0) Shop 0 ø 1) Inspector Other (B) 5)-Sub Total-Total-Serial Time To Complete: Total Manhours (60 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] Air Lock: 0 0 0 Ton 0 Ft. Hook Height Doors: 0 Ø [W/H][ft High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA OTV Canister: NA NASA Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

2 MECHANICAL ASSEMBLY Task No: Subtask No: < 2.0700> Hazard Level(*): 1 None Description: SMATE MECHANICAL CONNECTIONS Activity: CONNECT CRYO PORTS AND ALL OTHER MECHANICAL CONNECTIONS INCLUDING RCS LOAD LINES. Personnel: **Control Station** Vehicle Payload Specialist(s) 0) 0) 0) Engineering 3) Shop 0 0) Inspector Other Sub Total-5). Total-Serial Time To Complete: 300 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] 0 Ton Air Lock: 0 0 0 Ft.Hook Height Doors: 0 0 [W/H][ft High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 70 +/-50 +/- 5 % Power Cutoff: NA Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA OTV Canister: NA NASA Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No NA: Not Applicable or 3: Area Clear or 4: Facility Clear TD: To Be Determined

Task No: 3 ELECTRICAL ASSEMBLY Subtask No: < 3.0100> Description: <INSTALL CABLE HARNESS Hazard Level(+): 1 None Activity: INSTALL/CONNECT CABLE HARNESS ASSEMBLY Personnel: **Control Station** Vehicle Payload Specialist(s) (0) 0) Engineering O) 3) Shop Θĺ ΘŚ Inspector $\left\{\begin{array}{c}1\\0\end{array}\right\}$ Other Sub Total-5). Total-Serial Time To Complete: 360 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: Air Lock: 0 0 0 [W/D/H][ft] 0 Ton 0 Ft.Hook Height [W/H][ft] Doors: 0 0 High Bay: 70 100 85 [W/D/H][ft] 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K Temperature: E.C.S: Humidity: 50 +/- 5 9 Power Cutoff: NA 5 % 70 +/-Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Grounding: Y Personnel Airlock: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y OTV Adapter: NA Slings: NA Ground Power Unit: NA Breakout Boxes: NA Adapter Cables: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
ELECTRICAL ASSEMBLY
         Task No:
                     3
Subtask No: < 3.0200> Description: <INSTALL POWER SYSTEM > Hozard Level(*): 2 Local Clear Activity: ATTACH SLING TO LIFT POINTS AND O/H CRANE, INSPECT GUIDE PINS, ATTACH POINTS AND INTERFACES, LIFT TO POSITION, INSTALL, SECURE AND SAFE
Personnel:
                                                          Control Station
                       Vehicle
               Payload Specialist(s)
                                                                   0)
                                                                   0
               Engineering
                                                                   0
               Shop
                                          3)
               Inspector
                                                                   0)
                                          1)
               Other
                                          0)
                 Sub Total-
                                                   5)
                                                               Total-
                                                      Total Manhours (
                                                                          40.0)
Serial Time To Complete: 480 min
Automation Need: (Primary Key)
Automation Secondary Key(s)
                      Detailed Facility Resources
                                                             Crane Capacity:
                   Physical Size:
                                   [W/D/H][ft]
[W/H][ft]
                                                       0 Ton
          Air Lock:
                        0 0
                                                                   9 Ft. Hook Height
                                 0
              Doors:
                        A
                             0
          High Bay: 70 100 85 [W/D/H][ft]
                                                      20 Ton
                                                                  70 Ft. Hook Height
Standard Commerical Power: Y
                                       Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                       E.C.S: Humidity:
                                                                   Temperature:
                                             50 +/- 5 %
                                                                        70 +/-
                                                                                  5 F
                                       Power Cutoff: NA
Closed Circuit Television: NA
                                                                   Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                                                  Shop Air: NA
                                       Helium Supply: NA
Fire Protection/Deluge(*): A
                                       Shower/Eye Wash: NA
                                                                  Vacuum: NA
Lightning Protection: Y
                                       Potable Water: NA
                                                                  Paging: Y
Commercial Telephone: Y
                                       RF System(*): N
                                                                  OIS: NA
Personnel Airlock: Y
                                       Grounding: Y
                                                                   Explosion Proof: NA
                     Detailed Equipment Resources
                                Slings: Y
Special Tool Kit: Y
                                                         OTV Adapter: Y
Breakout Boxes: NA
                                Adapter Cables: NA
                                                         Ground Power Unit: NA
Air Pallet: NA
                                Work Stands: Y
                                                         Special Hoisting Equip: Y
NASA Conister: NA
                                OTV Conister: NA
                    (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                      RF System= A: S Band & C Band
                        or B: deluge
or C: both
                                                               or B: Ku Band
                                                               or C: both
                        or N: none
                                                               or N: none
                                                        Others:= Y: Yes
           Hazard Level:= 1: None
                        or 2: Local Clear
                                                                  N: No
                        or 3: Area Clear
                                                                  NA: Not Applicable
                        or 4: Facility Clear
```

TD: To Be Determined

```
ELECTRICAL ASSEMBLY
        Tosk No:
                                Description: <INSTALL GN&C SYSTEM
Subtask No: < 3.0300>
Hazard Level(+): 2 Local Clear
Activity: ATTACH SLING TO LIFT POINTS AND O/H CRANE, INSPECT GUIDE PINS.
ATTACH POINTS AND INTERFACES, LIFT TO POSITION, INSTALL SECURE AND SAFE
Personnel:
                    Vahicle
                                                    Control Station
             Payload Specialist(s)
                                                            ø,
             Engineering
                                                            0)
                                                            0)
             Shop
                                      3)
                                                            0)
                                      1)
             Inspector
                                      6)
             Other
               Sub Total-
                                              5)-
                                                                    55
                                                        Total-
Serial Time To Complete: 240 min
                                                                  20.0)
                                                Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                                                       Crane Capacity:
                 Physical Size:
                                [W/D/H][ft]
         Air Lock:
                     0 0
                             0
                                                 0 Ton
                                                            0 Ft. Hook Height
            Doors:
                          0
                                [W/H][ft]
                    70 100 85 [W/D/H][ft]
         High Bay:
                                                20 Ton
                                                           70 Ft. Hook Height
Standard Commercial Power: Y
                                   Instrumentation Power [Uninterrupted]: NA
                                   E.C.S: Humidity:
Cleanliness: 100K
                                                           Temperature:
                                        50 +/-
                                                                70 +/-
Closed Circuit Television: NA
                                   Power Cutoff: NA
                                                           Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                           Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                           Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                           Paging: Y
Commercial Telephone: Y
                                   RF System(*): N
                                                           OIS: NA
Personnel Airlock: Y
                                   Grounding: Y
                                                           Explosion Proof: NA
                  Detailed Equipment Resources
Special Tool Kit: Y
                             Slings: Y
                                                   OTV Adapter: Y
Breakout Boxes: NA
                             Adapter Cables: NA
                                                   Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: Y
                                                   Special Hoisting Equip: Y
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                RF System= A: S Band & C Band
                      or B: deluge
                                                        or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                  Others:= Y: Yes
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                          NA: Not Applicable
                      or 4: Facility Clear
                                                          TD: To Be Determined
```

```
3
                             ELECTRICAL ASSEMBLY
         Task No:
Subtask No: < 3.0400> Description: <INSTALL AVIONICS SYSTEM > Hazard Level(*): 2 Local Clear Activity: ATTACH SLING TO LIFT POINTS AND O/H CRANE, INSPECT GUIDE PINS, ATTACH
POINTS AND INTERFACES, LIFT TO POSITION, INSTALL, SECURE AND SAFE
Personnel:
                                                        Control Station
                      Vehicle
              Payload Specialist(s)
                                                                0)
                                                                0)
              Engineering
                                                                0
              Shop
                                        3)
              Inspector
                                                                e)
                                        0)
              Other
                Sub Total-
                                                 5)
                                                            Total-
Serial Time To Complete: 240 min
                                                   Total Manhours (
                                                                       20.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                     Detailed Facility Resources
                   Physical Size:
                                                           Crane Capacity:
                       0 0
                                  [W/D/H][ft]
                                                     0 Ton
          Air Lock:
                                                                 0 Ft.Hook Height
                                0
             Doors:
                       a
                           a
                                  [W/H][ft]
          High Bay: 70 100 85 [W/D/H][ft]
                                                   20 Ton
                                                               70 Ft. Hook Height
Standard Commerical Power: Y
                                      Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                     E.C.S: Humidity:
                                                                Temperature:
                                           50 +/- 5 %
                                                                     70 +/-
                                                                               5 F
                                     Power Cutoff: NA
                                                               Facility GN2: NA
Closed Circuit Television: NA
Fuel/Oxidizer Disposal: N
                                     Helium Supply: NA
                                                               Shop Air: NA
Fire Protection/Deluge(*): A
                                     Shower/Eye Wash: NA
                                                               Vacuum: NA
Lightning Protection: Y
                                     Potable Water: NA
                                                               Paging: Y
Commercial Telephone: Y
                                     RF System(*): N
                                                               OIS: NA
Personnel Airlock: Y
                                     Grounding: Y
                                                                Explosion Proof: NA
                    Detailed Equipment Resources
Special Tool Kit: Y
                               Slings: Y
                                                       OTV Adapter: Y
Breakout Boxes: NA
                               Adapter Cables: NA
                                                       Ground Power Unit: NA
Air Pallet: NA
                               Work Stands: Y
                                                       Special Hoisting Equip: Y
NASA Canister: NA
                               OTV Canister: NA
                   (*) Legend For Data Input
                                                    RF System= A: S Band & C Band
Fire Protection/Deluge= A: fire protection
                       or B: deluge
                                                            or B: Ku Band
                       or C: both
                                                            or C: both
                       or N: none
                                                             or N: none
                                                      Others:= Y: Yes
          Hazard Level:= 1: None
                       or 2: Local Clear
                                                               N: No
                                                               NA: Not Applicable TD: To Be Determined
                       or 3: Area Clear
```

or 4: Facility Clear

ELECTRICAL ASSEMBLY Task No: Subtask No: < 3.0500> Description: MAKE ALL ELECTRICAL CONNECTION ACTIVITY: CONNECT ALL ELECTRICAL CONNECTORS NECESSARY TO APPLY POWER AND PROVIDE COMMUNICATION FOR OTV CHECKOUT Description: MAKE ALL ELECTRICAL CONNECTORS> Personnei: Vehicle **Control Station** Payload Specialist(s) 0) 0) Engineering 9 9 Shop 3) Inspector 1) } es Other Sub Total-5)-Total-Serial Time To Complete: 300 min Total Manhours (25.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] 0 0 [W/H][ft] 70 100 85 [W/D/H][ft] Air Lock: 0 Ton 0 Ft.Hook Height Doors: High Boy: 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA **Breakout Boxes: Y** Adapter Cables: Y Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Conister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
Task No:
                             MECHANICAL SYSTEMS TEST
Subtask No: < 4.0100> Description: <LEAK AND PRESSURE CHECKS > Hazard Level(*): 2 Local Clear Activity: VERIFY PLUMBING CONNECTIONS, CONFIGURE N2 SYSTEM, PRESSURIZE TANK SET
ANDPROPULSION SYSTEM PLUMBING
Personnel:
                                                        Control Station
                      Vehicle
              Payload Specialist(s)
                                                                0)
                                        2 2 2 2 0
                                                                0)
              Engineering
              Shop
                                                                0
                                                                ø
              Inspector
              Other
                Sub Total-
                                                 6)-
                                                            Total-
Serial Time To Complete: 1380 min
                                                   Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                     Detailed Facility Resources
                  Physical Size:
                                                           Crane Capacity:
                               0 [W/D/H][ft]
          Air Lock:
                       0 0
                                                     0 Ton
                                                                0 Ft. Hook Height
             Doors:
                       ø
                           0
                                   W/H][ft]
          High Bay: 70 100 85 [W/D/H][ft]
                                                    0 Ton
                                                                0 Ft.Hook Height
Standard Commerical Power: Y
                                     Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                     E.C.S: Humidity:
                                                                Temperature:
                                          50 +/- 5 %
                                                                     70 +/-
                                     Power Cutoff: NA
                                                                Facility GN2: Y
Closed Circuit Television: NA
Fuel/Oxidizer Disposal: N
                                     Helium Supply: Y
                                                                Shop Air: Y
Fire Protection/Deluge(*): A
                                     Shower/Eye Wash: NA
                                                                Vacuum: NA
Lightning Protection: Y
                                     Potable Water: NA
                                                                Paging: Y
Commercial Telephone: Y
                                     RF System(*): N
                                                               OIS: NA
Personnel Airlock: Y
                                     Grounding: Y
                                                                Explosion Proof: NA
                    Detailed Equipment Resources
Special Tool Kit: NA
                                                       OTV Adapter: NA
                               Slings: NA
Breakout Boxes: NA
                               Adapter Cables: NA
                                                       Ground Power Unit: NA
Air Pallet: NA
                               Work Stands: Y
                                                       Special Hoisting Equip: NA
NASA Canister: NA
                               OTV Canister: NA
                   (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                    RF System= A: S Band & C Band
                       or B: deluge
                                                            or B: Ku Band
                       or C: both
                                                            or C: both
                       or N: none
                                                            or N: none
          Hazard Level:= 1: None
                                                      Others:= Y: Yes
                       or 2: Local Clear
                                                               N: No
                       or 3: Area Clear
                                                               NA: Not Applicable
```

TD: To Be Determined

or 4: Facility Clear

```
Task No:
                            ELECTRICAL SYSTEMS TEST
                                  Description: <GROUND POWER APPLICATION
Subtask No: < 5.0100>
Hazard Level(*): 1 None
Activity: APPLY POWER ON THE GROUND POWER UNIT . CONNECT LOAD BOXES TO ADAPTER CABLES AND ATTACH TO CPU OUTPUT-APPLY SIMULATED OTV LOAD
Personnel:
                                                      Control Station
                     Vehicle
              Payload Specialist(s)
                                                              0)
                                                              0)
              Engineering
                                       1)
                                       2)
                                                              0)
              Shop
              Inspector
                                       1)
                                                              Ø)
                                     \ e\
              Other
                Sub Total-
                                                          Total-
Serial Time To Complete: 240 min
                                                  Total Manhours (
                                                                     16.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                         Crane Capacity:
                         0
                                 [W/D/H][ft]
                                                   Ø Ton
         Air Lock:
                      0
                                                              0 Ft. Hook Height
                               0
                                 [W/H][ft]
            Doors:
                      Ø
                          a
         High Bay: 70 100 85 [W/D/H][ft]
                                                   0 Ton
                                                              0 Ft. Hook Height
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: Y
                                    E.C.S: Humidity:
Cleanliness: 100K
                                                             Temperature:
                                         50 +/-
                                                                   70 +/-
                                                                            5 F
                                    Power Cutoff: Y
Closed Circuit Television: NA
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                    Helium Supply: NA
                                                             Shop Air: NA
Fire Protection/Deluge(*): A
                                    Shower/Eye Wash: NA
                                                             Vacuum: NA
Lightning Protection: Y
                                    Potable Water: NA
                                                             Paging: Y
Commercial Telephone: Y
                                    RF System(*): A
                                                             OIS: NA
Personnel Airlock: Y
                                    Grounding: Y
                                                             Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                              Slings: NA
                                                     OTV Adapter: NA
Breakout Boxes: Y
                              Adapter Cables: Y
                                                     Ground Power Unit: Y
Air Pallet: NA
                              Work Stands: Y
                                                     Special Hoisting Equip: NA
NASA Conister: NA
                              OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                  RF System= A: S Band & C Band
                      or B: deluge
                                                          or B: Ku Band
                      or C: both
                                                          or C: both
                      or N: none
                                                          or N: none
          Hazard Level:= 1: None
                                                    Others:= Y: Yes
                      or 2: Local Clear
                                                             N: No
                       or 3: Area Clear
                                                            NA: Not Applicable
```

TD: To Be Determined

or 4: Facility Clear

```
ELECTRICAL SYSTEMS TEST
        Task No:
Subtask No: < 5.0200>
Hazard Level(*): 1 None
                                  Description: <SINGLE POINT GROUND CHECKS
Activity: PERFORM SINGLE POINT GROUND CHECKS
Personnel:
                     Vehicle
                                                      Control Station
              Payload Specialist(s)
                                       0)
                                                              0)
              Engineering
                                       1)
                                                              0)
                                       2)
                                                              0)
              Shop
                                       1)
              Inspector
              Other
                                       0)
                Sub Total-
                                                          Total-
Serial Time To Complete: 180 min
                                                  Total Manhours (
                                                                     12.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                         Crane Capacity:
                        0 0 [W/D/H][ft]
0 [W/H][ft]
         Air Lock:
                      0
                                                   0 Ton
                                                              0 Ft. Hook Height
            Doors:
                      0
         High Bay: 70 100 85 [W/D/H][ft]
                                                   0 Ton
                                                              0 Ft.Hook Height
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                              Temperature:
                                    50 +/- 5 %
Power Cutoff: Y
                                                                            5 F
                                                                   70 +/-
Closed Circuit Television: NA
                                                              Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                    Helium Supply: NA
                                                              Shop Air: NA
Fire Protection/Deluge(*): A
                                    Shower/Eye Wash: NA
                                                              Vacuum: NA
Lightning Protection: Y
                                    Potable Water: NA
                                                              Paging: Y
Commercial Telephone: Y
                                    RF System(*): A
                                                              OIS: NA
                                    Grounding: Y
Personnel Airlock: Y
                                                              Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                              Slings: NA
                                                     OTV Adapter: NA
Breakout Boxes: Y
                              Adapter Cables: Y
                                                     Ground Power Unit: Y
Air Pallet: NA
                              Work Stands: Y
                                                     Special Hoisting Equip: NA
NASA Canister: NA
                              OTV Canister: NA
                  (*) Legend For Data Input
                                                  RF System A: S Band & C Band
Fire Protection/Deluge= A: fire protection
                      or B: deluge
                                                           or B: Ku Band
                       or C: both
                                                           or C: both
                      or N: none
                                                           or N: none
          Hazard Level:= 1: None
                                                    Others:= Y: Yes
                      or 2: Local Clear
or 3: Area Clear
                                                             N: No
                                                             NA: Not Applicable
                       or 4: Facility Clear
                                                             TD: To Be Determined
```

ELECTRICAL SYSTEMS TEST Task No: Description: <ACTIVATE POWER/ESSENTIAL BUS > Subtask No: < 5.0300> Hazard Level(+): 1 None Activity: POWER ON THE POWER BUS AND VERIFY POWER PROFILE. POWER ON THE ESSENTIAL BUS AND VERIFY POWER PROFILE. Personnel: Control Station Vehicle Payload Specialist(s) 0) Ø) Engineering 2 1) 2) 2) Shop Inspector 1) Other (0) Sub Total-10) Total-Serial Time To Complete: Total Manhours (10.6) 69 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] [W/H][ft] Air Lock: 0 Ton 0 Ft. Hook Height 0 a Doors: High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft. Hook Height Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Closed Circuit Television: NA Power Cutoff: Y Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): A OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: Y Adapter Cables: Y Ground Power Unit: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
Task No:
                   5
                            ELECTRICAL SYSTEMS TEST
Subtask No: < 5.0400>
                                 Description: <AVIONICS POWER ON CHECKS
Hazard Level(*): 1 None
Activity: APPLY OTV AVIONICS BUS POWER FROM THE TEST SET OR THE OTVCS
Personnel:
                     Vehicle
                                                     Control Station
             Payload Specialist(s)
                                                             0)
                                                             2)
             Engineering
                                      2)
             Shop
             Inspector
                                     ( 0)
             Other
               Sub Total-
                                                         Total-
Serial Time To Complete: 180 min
                                                 Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                        Crane Capacity:
                                [W/D/H][ft]
         Air Lock:
                      0
                        0
                              0
                                                  0 Ton
                                                              6 Ft. Hook Height
            Doors:
                      0
                          0
                                 [W/H][ft
                    70 100 85 [W/D/H][ft]
         High Bay:
                                                              0 Ft.Hook Height
                                                  0 Ton
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                             Temperature:
                                    50 +/- 5
Power Cutoff: Y
                                                                  70 +/-
                                                             Facility GN2: NA
Closed Circuit Television: NA
Fuel/Oxidizer Disposal: N
                                    Helium Supply: NA
                                                             Shop Air: NA
Fire Protection/Deluge(*): A
                                    Shower/Eye Wash: NA
                                                             Vacuum: NA
Lightning Protection: Y
                                    Potable Water: NA
                                                             Paging: Y
Commercial Telephone: Y
                                    RF System(*): A
                                                             OIS: Y
Personnel Airlock: Y
                                    Grounding: Y
                                                             Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: Y
                             Adapter Cables: Y
                                                    Ground Power Unit: Y
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                          or B: Ku Band
                                                          or C: both
                      or C: both
                      or N: none
                                                          or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                                                            NA: Not Applicable
                      or 3: Area Clear
                      or 4: Facility Clear
                                                            TD: To Be Determined
```

```
ELECTRICAL SYSTEM TEST
         Task No:
                                  Description: < DPA SUBSYSTEM CHECKS
Subtask No: < 5:0500>
Hozord Level(*): 1 None
Activity: VERIFY ALL AVIONICS ARE ON AND TELEMETRY MEASUREMENTS ARE PROPER.
Personnel:
                                                      Control Station
                     Vehicle
              Payload Specialist(s)
                                       O)
                                                               Ø)
                                                               2)
              Engineering
                                       1)
                                       2)
              Shop
              Inspector
                                      \begin{pmatrix} 1 \\ 0 \end{pmatrix}
              Other
                Sub Total-
                                                4)-
                                                                      105
                                                           Total-
Serial Time To Complete:
                             30 min
                                                  Total Manhours (
                                                                       5.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                          Crane Capacity:
                      0 0 0 [W/D/H][ft]
0 0 [W/H][ft]
                                                    0 Ton
                                                               0 Ft. Hook Height
          Air Lock:
             Doors:
         High Bay: 70 100 85 [W/D/H][ft]
                                                               0 Ft. Hook Height
                                                    0 Ton
Standard Commerical Power: Y
                                     Instrumentation Power [Uninterrupted]: Y
                                     E.C.S: Humidity:
Cleanliness: 100K
                                                              Temperature:
                                    50 +/- 5 %
Power Cutoff: Y
                                                                   70 +/-
Closed Circuit Television: NA
                                                              Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                                              Shop Air: NA
                                     Helium Supply: NA
Fire Protection/Deluge(*): A
                                     Shower/Eye Wash: NA
                                                              Vacuum: NA
Lightning Protection: Y
                                     Potable Water: NA
                                                              Paging: Y
Commercial Telephone: Y
                                                              OIS: Y
                                     RF System(*): A
Personnel Airlock: Y
                                     Grounding: Y
                                                              Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                              Slings: NA
                                                      OTV Adapter: NA
Breakout Boxes: Y
                              Adapter Cables: Y
                                                      Ground Power Unit: Y
Air Pallet: NA
                              Work Stands: Y
                                                      Special Hoisting Equip: NA
NASA Canister: NA
                              OTV Conister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                   RF System= A: S Band & C Band
                                                           or B: Ku Band
                       or B: deluge
                       or C: both
                                                           or C: both
                       or N: none
                                                           or N: none
                                                     Others:= Y: Yes
          Hazard Level:= 1: None
                       or 2: Local Clear
                                                              N: No
                       or 3: Area Clear
                                                             NA: Not Applicable
                       or 4: Facility Clear
                                                             TD: To Be Determined
```

```
INTEGRATED SYSTEM TEST
        Task No:
Subtask No: < 6.0100>
Hazard Level(*): 1 None
                                 Description: <AEROBRAKE CONTROL CHECKS
Activity: PERFORM AEROBRAKE CHECKS TO VERIFY PROPER OPERATION OF ALL
COMPONENTS.
Personnel:
                                                     Control Station
                     Vehicle
             Payload Specialist(s)
                                      0)
                                                             0)
                                                             2 2 2
             Engineering
                                      2)
6)
2)
             Shop
             Inspector
                                     ( 2)
( 0)
             Other
                                            -( 10)-
               Sub Total-
                                                         Total.
                                                                     16)
Serial Time To Complete: 480 min
                                                 Total Manhours (128.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                        Crane Capacity:
                                [W/D/H][ft]
         Air Lock:
                     0 0
                              0
                                                  0 Ton
                                                             9 Ft. Hook Height
                      0
                          0
            Doors:
                                 [W/H][ft
         High Bay: 70 100 85 [W/D/H][ft]
                                                  0 Ton
                                                              0 Ft. Hook Height
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: Y
                                   E.C.S: Humidity:
Cleanliness: 100K
                                                             Temperature:
                                         50 +/- 5 %
                                                                  70 +/-
                                   Power Cutoff: Y
Closed Circuit Television: Y
                                                             Facility GN2: Y
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                             Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                             Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                             Paging: Y
Commercial Telephone: Y
                                   RF System(*): A
                                                             OIS: Y
Personnel Airlock: Y
                                   Grounding: Y
                                                             Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: Y
                             Adapter Cables: Y
                                                    Ground Power Unit: Y
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
                                                   Others:= Y: Yes
         Hazard Level:= 1: None
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

```
INTEGRATED SYSTEM TEST
        Task No:
Subtask No: < 6.0200>
Hazard Level(*): 2 Local Clear
                                 Description: <EXTENDABLE EXIT CONE CHECKS
Activity: EXTEND/RETRACT EEC-VERIFY ALL COMPONENTS ARE OPERATING PROPERLY.
Personnel:
                                                     Control Station
                     Vehicle
             Payload Specialist(s) (
                                      A)
                                      2)
             Engineering
                                                             2
                                                            2
             Shop
             Inspector
             Other
                                      0)
               Sub Total-
                                              5)-
                                                         Total-
Serial Time To Complete: 240 min
                                                 Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                                                        Crane Capacity:
                  Physical Size:
                    0 0
                              0 [W/D/H][ft]
                                                  0 Ton
         Air Lock:
                                                             0 Ft. Hook Height
                                 [W/H][f
            Doors:
                      0
                          Ø
         High Bay: 70 100 85 [W/D/H][ft]
                                                  0 Ton
                                                             0 Ft. Hook Height
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: Y
                                    E.C.S: Humidity:
Cleanliness: 100K
                                                            Temperature:
                                   50 +/- 5 %
Power Cutoff: Y
                                                                 70 +/-
                                                            Facility GN2: NA
Closed Circuit Television: Y
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                            Paging: Y
Commercial Telephone: Y
                                   RF System(*): C
                                                            OIS: Y
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: Y
                             Adapter Cables: Y
                                                    Ground Power Unit: Y
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

```
INTEGRATED SYSTEM TEST
        Task No:
                                 Description: < ENGINE GIMBLE CHECKS
Subtask No: < 6.0300>
Hazard Level(*): 2 Local Clear
Activity: CONFIGURE GPS/OTV GSE AND TRANSMISSION SYSTEM, TRANSMIT COMMAND
(Ku-BAND CLR)
Personnel:
                                                    Control Station
                    Vehicle
             Payload Specialist(s)
                                      2)
                                                           ) 2)
( 2)
( 2)
             Engineering
             Shop
             Inspector
                                      1)
                                      e)
             Other
               Sub Total-
                                              5)
                                                        Total-
Serial Time To Complete: 120 min
                                                Total Manhours (
                                                                   22.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                        Crane Capacity:
                             0 [W/D/H][ft]
[W/H][ft]
         Air Lock:
                     0 0
                                                 0 Ton
                                                             0 Ft.Hook Height
                          a
            Doors:
                     A
                    70 100 85 [W/D/H][ft]
         High Bay:
                                                 0 Ton
                                                             0 Ft.Hook Height
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: Y
                                   E.C.S: Humidity:
Cleanliness: 100K
                                                            Temperature:
                                        50 +/- 5 %
                                                                 70 +/-
                                                            Facility GN2: NA
Closed Circuit Television: Y
                                   Power Cutoff: Y
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                            Paging: Y
Commercial Telephone: Y
                                                            OIS: Y
                                   RF System(*): C
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: NA
                  Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                   OTV Adapter: NA
Breakout Boxes: Y
                             Adapter Cables: Y
                                                   Ground Power Unit: Y
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
                                                RF System= A: S Band & C Band
Fire Protection/Deluge= A: fire protection
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
```

TD: To Be Determined

```
INTEGRATED SYSTEM TEST
        Task No: 6
Subtask No: < 6.0400>
Hazard Level(*): 1 None
                                 Description: <INTEGRATED SYSTEMS CHECKS
Activity: CONFÍGURE GPS/OTV GSE AND TRANSMISSION SYSTEMS. TRANSMIT COMMAND
(KU-BAND CLR)
Personnel:
                     Vehicle
                                                     Control Station
             Payload Specialist(s)
                                                             0)
                                      2)
2)
1)
                                                             2)
             Engineering
             Shop
             Inspector
             Other
                                      0)
               Sub Total-
                                               5)-
                                                         Total-
Serial Time To Complete: 1438 min
                                                 Total Manhours (263.6)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                        Crane Capacity:
                     0 0
         Air Lock:
                                [W/D/H][ft]
                                                  0 Ton
                                                             0 Ft. Hook Height
                          0
            Doors:
                      0
                                 [W/H][ft]
                     70 100 85 [W/D/H][ft]
         High Bay:
                                                  0 Ton
                                                              6 Ft. Hook Height
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                            Temperature:
                                         50 +/-
                                                                  70 +/-
Closed Circuit Television: NA
                                    Power Cutoff: Y
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                                            Shop Air: NA
                                   Helium Supply: NA
Fire Protection/Deluge(*): A
                                    Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: Y
                                    Potable Water: NA
                                                            Paging: Y
Commerical Telephone: Y
                                    RF System(*): C
                                                            OIS: Y
Personnel Airlock: Y
                                    Grounding: Y
                                                            Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: Y
                             Adapter Cables: Y
                                                    Ground Power Unit: Y
Air Pailet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
or C: both
                      or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                                                            NA: Not Applicable
                      or 3: Area Clear
                      or 4: Facility Clear
                                                            TD: To Be Determined
```

INTEGRATED SYSTEM TEST Task No: Subtask No: < 6.0500> Description: <GPS OPERATION CHECKS Hazard Level(+): 1 None Activity: CONFIGURE GPS/OTV/GSE AND TRANSMISSION SYSTEM Personnel: Vehicle **Control Station** Payload Specialist(s) O) 2) 2) 1) 2) Engineering Shop Inspector Other 5). Sub Total-Total-Serial Time To Complete: 720 min Total Manhours (132.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] 0 0 [W/H][ft] 0 Ton 0 Ft. Hook Height Air Lock: Doors: High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft. Hook Height Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: 50 +/- 5 % Cleanliness: 100K Temperature: 70 +/-Power Cutoff: Y Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Shower/Eye Wash: NA Fire Protection/Deluge(*): A Vacuum: NA Potable Water: NA Lightning Protection: Y Paging: Y Commercial Telephone: Y RF System(*): C OIS: Y Grounding: Y Personnel Airlock: Y **Explosion Proof: NA** Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Adapter Cables: Y Breakout Boxes: Y Ground Power Unit: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear or 3: Area Clear N: No NA: Not Applicable or 4: Facility Clear TD: To Be Determined

7 OTV/CS-G TEST Task No: Subtask No: < 7.0100> Hazard Level(*): 1 None Description: <OTVCS RF TEST Activity: CONFIGURE OTV/GPS/GSE AND TRANSMISSION SYSTEM, TRANSMIT COMMANDS Personnei: Control Station Vehicle Payload Specialist(s) 0) 2) 2) 2) 2) 2) Engineering Shop Inspector 1) Other ø) Sub Total-5). Total-Serial Time To Complete: 960 min Total Manhours (176.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] [W/H][ft] Air Lock: 0 Ton 0 Ft. Hook Height 0 Doors: High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Power Cutoff: Y Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Shop Air: NA Helium Supply: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): C OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: Y Adapter Cables: Y Ground Power Unit: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

1

MOVE TO CRYO LOAD FACILITY Task No: Description: <PREP FOR TRANSPORT TO CRYO FAC> Subtask No: < 8.0100> Hozard Level(*): 1 None
Activity: BREAK TEST CONFIGURATION—INSTALL PROTECTIVE COVERS/DEVICES—INSTALL SLING FITTING FIXTURE-REMOVE HOLDDOWN HARDWARE Personnel: Control Station Vehicle Payload Specialist(s) (0) Engineering 0) 5) Shop 0 Inspector 0) Other Sub Total-8) Total. Serial Time To Complete: 240 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: Air Lock: 0 0 [W/D/H][ft] 0 Ton 0 Ft. Hook Height 0 0 0 [W/H][ft] Doors: 70 100 85 [W/D/H][ft] High Bay: 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % Power Cutoff: NA 70 +/-5 F Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y **Explosion Proof: NA** Detailed Equipment Resources Special Tool Kit: Y Slings: Y OTV Adapter: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: MOVE TO CRYO LOAD FACILITY Description: <REMOVE OTV FROM WORKSTAND Subtask No: < 8.0200> Hazard Level(*): 1 None
Activity: MOVE TRANSPORTER INTO OTV HIGH BAY-REMOVE COVER-TRANSPORT OTV FROM
WORKSTAND TO CANISTER-INSTALL/SECURE OTV IN CANISTER-INSTALL COVER Personnel: **Control Station** Vehicle Payload Specialist(s) 0) 1) 5) 2) 0) ø) Engineering Ø) Shop Inspector 0) Other Sub Total-8) Total. Serial Time To Complete: 540 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: 40 40 Doors: 35 45 50 [W/D/H][ft] 10 Ton 45 Ft. Hook Height Doors: (W/H][ft] High Bay: 70 100 85 [W/D/H][ft] 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(+): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: Y OTV Adapter: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pollet: NA Work Stands: Y Special Hoisting Equip: Y NASA Canister: NA OTV Canister: Y (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

MOVE TO CRYO LOAD FACILITY

Task No:

Subtask No: < 8.0300> Description: SMOVE OTV TO CRYO FACILITY Hazard Level(*): 1 None Activity: MOVE OTV TRANSPORTER AND CANISTER TO CRYO FACILITY. Personnel: Control Station Vehicle Payload Specialist(s) 0) Engineering 1) 2) 0) Shop 1) Inspector 0) 0) Other Sub Total-Total-Serial Time To Complete: 240 min Total Manhours (16.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 0 0 [W/D/H][ft] 0 0 [W/H][ft] Air Lock: 0 Ton 0 Ft.Hook Height Doors: 0 [W/D/H][ft] High Bay: Ø ø 0 Ton 0 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % 70 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: Y Vacuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Grounding: Y Personnel Airlock: NA Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: Y OTV Canister: Y NASA Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No:

OTV CRYO LOAD AND DRAIN

```
Description: <INSTALL OTV INTO CRYO LOAD FAC>
Subtask No: < 9.0100>
Hazard Level(*): 1 None
Activity: ATTACH SLING TO OTV STRUCTURE- ATTACH TO 0/H CRANE-REMOVE HOLDOWN
HARDWARE-LIFT OTV FROM TRANSPORTER-INSTALL OTV IN CRYO STAND
Personnel:
                                                     Control Station
                    Vehicle
             Payload Specialist(s)
                                                             0)
                                                             0)
             Engineering
                                      1)
                                      5)
2)
             Shop
                                                             Ð)
                                                             0)
             Inspector
                                      ē١
             Other
               Sub Total-
                                              8)-
                                                                     Ø)
                                                         Total-
                                                                     8)
                                                                   32.0)
Serial Time To Complete: 240 min
                                                 Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                 Physical Size:
                                                        Crane Capacity:
         Air Lock: 40 40 50 [W/D/H][ft]
                                                 10 Ton
                                                            45 Ft. Hook Height
                     35
            Doors:
                        45
                                 [w/H][ft]
         High Bay: 70 100 85 [W/D/H][ft]
                                                20 Ton
                                                            70 Ft. Hook Height
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                   E.C.S: Humidity:
                                                            Temperature:
                                        50 +/-
                                                                 70 +/-
Closed Circuit Television: NA
                                   Power Cutoff: NA
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: Y
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: Y
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: Y
                                                            Paging: Y
Commercial Telephone: Y
                                   RF System(*): N
                                                            OIS: NA
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: NA
                  Detailed Equipment Resources
Special Tool Kit: Y
                             Slings: Y
                                                    OTV Adapter: Y
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: Y
NASA Canister: NA
                             OTV Canister: Y
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

OTV CRYO LOAD AND DRAIN Task No: Subtask No: < 9.0200> Hazard Level(*): 3 Area Clear Description: <CONNECT CRYO LINES TO VEHICLE > Activity: CONNECT CRYO LOADING LINES TO OTV. Personnel: **Control Station** Vehicle Payload Specialist(s) 0) Engineering Shop O) 2) Inspector Other Sub Total-8)-Total-32.0) Serial Time To Complete: 240 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] [W/H][ft] 0 Ton 0 0 Air Lock: 0 Ft.Hook Height Doors: 0 0 High Boy: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Facility GN2: NA Closed Circuit Television: Y Power Cutoff: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: Y Vacuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Grounding: Y Personnel Airlock: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Special Hoisting Equip: NA Work Stands: Y NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No:

OTV CRYO LOAD AND DRAIN

Description: <LOAD CRYO IN OTV Subtask No: < 9.0300> Hazard Level(*): 4 Facility Clear Activity: LOAD CRYO TO PREDEFINED LEVEL AND PRESSURE. Personnel: Control Station Vehicle Payload Specialist(s) (Ø) 2) 0) Engineering e) Shop Inspector Other ΘÌ Sub Total-0). Total-Serial Time To Complete: 240 min Total Manhours (24.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] 0 0 0 Ton Air Lock: 0 0 Ft.Hook Height 0 Doors: High Bay: 70 100 85 [W/D/H][ft] 0 Ft.Hook Height 0 Ton Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 70 +/-50 +/- 5 % Closed Circuit Television: Y Power Cutoff: Y Facility GN2: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): B Shower/Eye Wash: Y Vacuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y **Explosion Proof: Y Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
OTV CRYO LOAD AND DRAIN
        Task No:
Subtask No: < 9.0400> Des
Hazard Level(*): 4 Facility Clear
                                 Description: <VERIFY CRYO LOAD PARAMETERS >
Activity: USE THE OTVCS TO VERIFY ALL CRYO LOAD PARAMETERS
Personnel:
                    Vehicle
                                                     Control Station
             Payload Specialist(s)
                                      8)
                                                             0)
             Engineering
                                      0)
                                                             2)
                                                             2)
2)
             Shop
                                      0)
                                      øS
             Inspector
                                    \ e\
             Other
               Sub Total-
                                               0)-
                                                         Total
                                                                      6)
Serial Time To Complete:
                            60 min
                                                 Total Manhours (
                                                                     6.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                        Crane Capacity:
                    0 0 0 [W/D/H][ft]
         Air Lock:
                                                  0 Ton
                                                             6 Ft. Hook Height
                      0
                          0
                                [W/H][ft]
            Doors:
         High Bay: 70 100 85 [W/D/H][ft]
                                                             0 Ft.Hook Height
                                                  0 Ton
                                   Instrumentation Power [Uninterrupted]: Y
Standard Commercial Power: Y
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                            Temperature:
                                   50 +/- 5 %
Power Cutoff: Y
                                                                  70 +/-
                                                                           5 F
Closed Circuit Television: Y
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: Y
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): B
                                   Shower/Eye Wash: Y
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: Y
                                                            Paging: Y
                                   RF System(*): N
Commercial Telephone: Y
                                                            OIS: NA
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: Y
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

Task No:

```
9
                           OTV CRYO DRAIN AND PURGE
                                Description: <LOAD FUEL CELLS
Subtask No: < 9.0500>
Hazard Level(*): 4 Facility Clear
Activity: LOAD FUEL CELLS AND VERIFY ALL LOAD PARAMETERS
Personnel:
                                                    Control Station
                    Vehicle
             Payload Specialist(s) (
                                     0)
                                                            0)
                                                            2)
2)
2)
             Engineering
                                      0)
             Shop
                                      0)
                                     0)
             Inspector
             Other
               Sub Total-
                                              0)-
                                                        Total-
                                                Total Manhours (
Serial Time To Complete: 240 min
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                                                       Crane Capacity:
                 Physical Size:
                    0 0 0
                                [W/D/H][ft]
[W/H][ft]
                                                 0 Ton
                                                            0 Ft. Hook Height
         Air Lock:
            Doors:
                         0
                     Ø
         High Boy: 70 100 85 [W/D/H][ft]
                                                 0 Ton
                                                            0 Ft.Hook Height
                                   Instrumentation Power [Uninterrupted]: Y
Standard Commerical Power: Y
                                   E.C.S: Humidity:
Cleanliness: 100K
                                                           Temperature:
                                        50 +/- 5 %
                                                                70 +/-
                                   Power Cutoff: Y
                                                           Facility GN2: NA
Closed Circuit Television: Y
                                                           Shop Air: NA
Fuel/Oxidizer Disposal: Y
                                   Helium Supply: NA
Fire Protection/Deluge(*): B
                                   Shower/Eye Wash: Y
                                                           Vacuum: NA
Lightning Protection: Y
                                   Potable Water: Y
                                                           Paging: Y
Commercial Telephone: Y
                                   RF System(*): A
                                                           OIS: NA
Personnel Airlock: Y
                                   Grounding: Y
                                                           Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                   OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                   Ground Power Unit: Y
Air Pallet: NA
                             Work Stands: Y
                                                   Special Hoisting Equip: NA
NASA Conister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                RF System= A: S Band & C Band
                      or B: deluge
                                                        or B: Ku Band
                                                        or C: both
                      or C; both
                      or N: none
                                                        or N: none
         Hazard Level:= 1: None
                                                  Others:= Y: Yes
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                          NA: Not Applicable
                                                          TD: To Be Determined
                      or 4: Facility Clear
```

```
OTV CRYO DRAIN AND PURGE
        Task No:
                                 Description: <DRAIN CRYO AND PURGE
Subtask No: < 9.0600>
Hazard Level(*): 4 Facility Clear
Activity: USING CRYO CART, UNLOAD CRYO AND PURGE-VERIFY CRYO LIMITS PER
INSPECTION KIT
Personnel:
                                                      Control Station
                     Vehicle
             Payload Specialist(s)
                                       0)
                                                              Ø)
                                                              2)
2)
2)
             Engineering
                                       0)
                                       ø)
             Shop
                                       0)
             Inspector
             Other
                                       ø
                Sub Total-
                                               0)
                                                          Total-
Serial Time To Complete: 240 min
                                                                     24.0)
                                                 Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                                                         Crane Capacity:
                  Physical Size:
                      0 0 0 [W/D/H][ft]
0 0 [W/H][ft]
         Air Lock:
                                                   0 Ton
                                                              9 Ft. Hook Height
            Doors:
         High Bay: 70 100 85 [W/D/H][ft]
                                                   0 Ton
                                                              0 Ft.Hook Height
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                             Temperature:
                                         50 +/-
                                                                  70 +/-
Closed Circuit Television: Y
                                    Power Cutoff: Y
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: Y
                                    Helium Supply: Y
                                                             Shop Air: NA
Fire Protection/Deluge(*): B
                                    Shower/Eye Wash: Y
                                                             Vacuum: NA
                                    Potable Water: Y
Lightning Protection: Y
                                                             Paging: Y
Commercial Telephone: Y
                                    RF System(*): A
                                                             OIS: NA
Personnel Airlock: Y
                                    Grounding: Y
                                                             Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: NA
                              Slings: NA
                                                     OTV Adapter: NA
Breakout Boxes: NA
                              Adapter Cables: NA
                                                     Ground Power Unit: NA
Air Pallet: NA
                              Work Stands: Y
                                                     Special Hoisting Equip: NA
NASA Conister: NA
                              OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                  RF System= A: S Band & C Band
                      or B: deluge
                                                          or B: Ku Band
                      or C: both
                                                          or C: both
                      or N: none
                                                          or N: none
          Hazard Level:= 1: None
                                                    Others:= Y: Yes
                      or 2: Local Clear
                                                             N: No
                      or 3: Area Clear
                                                            NA: Not Applicable
```

TD: To Be Determined

Task No:

OTV CRYO DRAIN AND PURGE

Description: <FUEL CELL POWER TEST Subtask No: < 9.0700> Hazard Level(*): 4 Facility Clear Activity: VERIFY OTV BUS POWER IS APPLIED VIA GPU. ACTIVATE FUEL CELLS. APPLY OTV LOAD TO FUEL CELL POWER UNIT. VERIFY, APPLY LOADS TO GPU. REMOVE POWER. Personnel: **Control Station** Vehicle Payload Specialist(s) 2) 2) 2) Engineering e) ě٥ Shop Inspector 0) (e) Other Sub Total-0). Total-Serial Time To Complete: 240 min Total Manhours (24.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 Ton 0 Ft.Hook Height a Doors: ø High Boy: 70 100 85 [W/D/H][ft] 0 Ton @ Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % 70 +/-5 F Closed Circuit Television: Y Power Cutoff: Y Facility GN2: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): B Shower/Eye Wash: Y Vacuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commerical Telephone: Y RF System(*): A OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: Y Detailed Equipment Resources Special Tool Kit: NA Stings: NA OTV Adapter: NA **Breakout Boxes: Y** Adapter Cables: Y Ground Power Unit: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
OTV CRYO LOAD AND DRAIN
        Task No:
Subtask No: < 9.0800>
Hazard Level(*): 3 Area Clear
                                 Activity: DISCONNECT ALL CRYO LINES FROM OTV
Personnei:
                    Vehicle
                                                     Control Station
             Payload Specialist(s)
                                                             0)
             Engineering
                                                             0)
                                      5)
2)
             Shop
                                                             0)
             Inspector
             Other
                                      e)
               Sub Total-
                                              8).
                                                                     O)
                                                         Total-
                                                                     8)
Serial Time To Complete:
                            60 min
                                                 Total Manhours (
                                                                    8.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                        Crane Capacity:
         Air Lock:
                    0 0
                              0 [W/D/H][ft]
                                                  0 Ton
                                                             0 Ft. Hook Height
         Doors: 0 0 {W/H][ft]
High Bay: 70 100 85 [W/D/H][ft]
                                                  @ Ton
                                                             6 Ft.Hook Height
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: Y
                                   E.C.S: Humidity:
Cleanliness: 100K
                                                            Temperature:
                                   50 +/- 5 %
Power Cutoff: Y
                                                                          5 F
                                                                 70 +/-
Closed Circuit Television: Y
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: Y
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): B
                                   Shower/Eye Wash: Y
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: Y
                                                            Paging: Y
Commercial Telephone: Y
                                   RF System(*): A
                                                            OIS: NA
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: Y
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

Task No: 10 MOVE OTV TO INT FACILITY Subtask No: < 10.0100> Description: <REMOVE OTV FROM THE CRYO STAND> Hazard Level(*): 2 Local Clear Activity: ATTACH SLING TO OTV STRUCTURE-ATTACH TO O/H CRANE-REMOVE HOLDDOWN HARDWARE-LIFT OTV FROM CRYO STAND Personnel: Vehicle **Control Station** Payload Specialist(s) 0) Engineering 0 (5) (2) (0) Shop 0) 0) Inspector Other Sub Total-٠(8)-Total-Serial Time To Complete: 120 min Total Manhours (16.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 35 45 [W/D/H][ft] 0 Ton Air Lock: 0 Ft. Hook Height [W/H][ft] Doors: High Bay: 70 100 85 [W/D/H][ft] 70 Ft. Hook Height 20 Ton Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-70 +/-5 % Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: Y Vocuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: Y OTV Adapter: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: Y NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

MOVE OTV TO INT FACILITY Task No: 10 Subtask No: < 10.0200> Description: <INSTALL OTV INTO TRANSPORTER > Hazard Level(*): 2 Local Clear Activity: INSTALL OTV INTO TRANSPORTER-SECURE Personnel: **Control Station** Vehicle Payload Specialist(s) 0) Engineering 1) 0) 0) Shop 2 ø) Inspector (2) (0) Other Sub Total-8). Total Serial Time To Complete: 180 min Total Manhours (24.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: 40 40 50 [W/D/H][ft]
Doors: 0 0 [W/H][ft] 10 Ton 45 Ft.Hook Height 0 [W/D/H][ft] High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y **Explosion Proof: NA Detailed Equipment Resources** Special Tool Kit: Y Slings: Y OTV Adapter: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Special Hoisting Equip: Y Work Stands: NA NASA Canister: NA OTV Canister: Y (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

Task No: 10 MOVE OTV TO INT FACILITY Subtask No: < 10.0300> Description: MOVE TRANSPORT TO INT FACILITY> Hazard Level(+): 1 None Activity: TRANSPORT OTV TO SPACE CRAFT INTEGRATION FACILITY Personnel: Control Station Vehicle Payload Specialist(s) Engineering Shop ø) 3) Inspector 1) ø) Other e١ Sub Total-5)-Total-Serial Time To Complete: 120 min 10.0) Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] Air Lock: 0 0 0 Ton 0 Ft.Hook Height Doors: Ø A [W/H][ft] [W/D/H][ft] High Bay: 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: 50 +/- 5 % Cieonliness: 100K Temperature: 5 F 5 % 70 +/-Power Cutoff: NA Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y OIS: NA RF System(*): N Personnel Airlock: NA Grounding: Y Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: NA OTV Adapter: NA Slings: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Canister: Y (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear or 3: Area Clear N: No NA: Not Applicable

TD: To Be Determined

MOVE OTV TO INT FACILITY Task No: 10 Subtask No: < 10.0400> Hazard Level(*): 1 None Description: SMOVE TRANPORTER INTO AIRLOCK > Activity: ATTACH SLING TO OTV STRUCTURE-ATTACH TO O/H CRANE-REMOVE HOLDDOWN HARDWARE-LIFT OTV INTO AIRLOCK Personnel: Vehicle **Control Station** Payload Specialist(s) 0) Engineering 0 5) Shop 0 ø١ Inspector 9) Other Sub Total-8)-Total-8) Serial Time To Complete: 120 min Total Manhours (16.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 40 50 [W/D/H][ft] Air Lock: 10 Ton 40 45 Ft. Hook Height [W/H][ft] 0 [W/D/H][ft] Doors: 0 High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-5 % 70 +/-Power Cutoff: NA Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: Y Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: Y Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA OTV Adapter: Y Slings: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: Y (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable TD: To Be Determined or 4: Facility Clear

MOVE OTV TO INT FACILITY Task No: 10 Subtask No: < 10.0500> Hazard Level(*): 2 Local Clear Description: <INSTALL OTV INTO WORKSTAND Activity: ATTACH SLINGS TO OTV STRUCTURE-ATTACH TO O/H CRANE-INSTALL/SECURE OTV ON WORKSTAND-INSTALL HOLDDOWN HARDWARE Personnel: Control Station Vehicle Payload Specialist(s) 0) 0) Engineering 1) 5) 0) Shop ě١ 2) Inspector Other ø) Sub Total-8)-Total-Serial Time To Complete: 248 min Total Manhours (32.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] 35 45 [W/H][ft] 0 Ton 0 Ft.Hook Height Air Lock: Doors: 70 100 85 [W/D/H][ft] 70 Ft. Hook Height High Bay: 20 Ton Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/-5 F 5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Vacuum: NA Shower/Eye Wash: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: NA RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y **Explosion Proof: NA Detailed Equipment Resources** Special Tool Kit: Y Slings: Y OTV Adapter: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: Y NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

. OTV SPACECRAFT MATE Task No: 11 Subtask No: < 11.0100> Description: Description: Description: Personnel: **Control Station** Vehicle Payload Specialist(s) 0) 0) Engineering 1) 6) 0 Shop 2) Inspector 0) Other Sub Total-9) Total-9) Total Manhours (72.0) Serial Time To Complete: 480 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 9 0 [W/D/H][ft] [W/H][ft] 0 0 Ton 0 Ft.Hook Height Air Lock: Doors: 0 0 High Bay: 70 100 85 [W/D/H][ft] 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y OIS: NA Commercial Telephone: Y RF System(*): N Personnel Airlock: Y Grounding: Y **Explosion Proof: NA Detailed Equipment Resources** Special Tool Kit: Y Slings: Y OTV Adapter: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or C: both or B: Ku Band or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

OTV SPACECRAFT MATE Task No: 11 Subtask No: < 11.0200> Hazard Level(+): 1 None Description: <ELECTRICALLY MATE OTV TO S/C > Activity: VERIFY/CONNECT ALL S/C ELECTRICAL CABLES Personnel: Control Station Vehicle Payload Specialist(s) Ø) Engineering 0 0) 2) Shop Inspector Other 6) Sub Total 4). Total-Serial Time To Complete: 240 min Total Manhours (16.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] Air Lock: 0 0 Ton 9 Ft. Hook Height A A Doors: 70 100 85 [W/D/H][ft] High Bay: 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Temperature: Cleanliness: 100K 50 +/- 5 % 5 F 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vocuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: Y Adapter Cables: Y Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

OTV SPACECRAFT INTEGRATION

Task No: 12

Subtask No: < 12.0100> Hazard Level(*): 1 None Description: <OTV S/C SINGLE POINT GROUND Activity: PERFORM SINGLE POINT GROUND CHECKS BETWEEN OTV AND S/C. Personnel: Control Station Vehicle Payload Specialist(s) 0) 0) Engineering Shop 2) 0) 1) eί Inspector Other 0) Sub Total-4)-Total-Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 0 [W/D/H][ft] 0 [W/H][ft] Air Lock: 0 0 Ton 0 Ft.Hook Height Doors: 0 High Bay: 70 100 85 [W/D/H][ft] 0 Ft. Hook Height 0 Ton Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: 50 +/- 5 % Cleanliness: 100K Temperature: 70 +/-5 F Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA OTV Adapter: NA Slings: NA Adapter Cables: Y Breakout Boxes: Y Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

OTV SPACECRAFT INTEGRATION Task No: 12 Subtask No: < 12.0300> Description: <</br>

Hazard Level(*): 1 None

Activity: CONNECT S/C TO S/C GROUND POWER UNIT Description: <CONNECT S/C TO GPU Personnel: Vehicle **Control Station** Payload Specialist(s) 0) ø) Engineering 1) 0) 2) Shop Inspector e۶ Other Sub Total-4). Total Total Manhours (Serial Time To Complete: 120 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 Ton 0 Ft.Hook Height Doors: 0 a High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Power Cutoff: NA Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: Y Adapter Cables: Y Ground Power Unit: Y Work Stands: Y Air Pallet: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

OTV SPACECRAFT INTEGRATION Task No: 12 Subtask No: < 12.0400> Description: <CONNECT INSTRUMENTATION CABLES> Hazard Level(*): 1 None Activity: CONNECT OTV INSTRUMENTATION CABLES TO OTV GSE AND S/C INSTRUMENTATION CABLES TO S/C GSE. APPLY POWER TO THE OTV. Personnel: Vehicle Control Station Payload Specialist(s) 2) Engineering 4) Shop Inspector 9 Other Sub Total-7) 13) Total-Total Manhours (Serial Time To Complete: 120 min 26.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 0 Ton 0 Ft. Hook Height Doors: a a 70 100 85 [W/D/H][ft] High Bay: 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-5 % 70 +/-Power Cutoff: Y Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(+): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): C OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: Y Adapter Cables: Y Ground Power Unit: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
Teek No: 12
                              OTV SPACECRAFT INTEGRATION
Subtask No. < 12.0500> Description: < MD/DATA RE CALL Hazard Lower (*): 1 None.

Activity: VERIFY TELEMETRY AND COMMAND RF LINKS TO OTV AND S/C
                                    Description: < CMD/DATA RF CHECKS
Personn&4.5
                       Vehicle
                                                        Control Station
               Payload Specialist(s)
                                                                 2 2 2
               Engineering
                                         2)
               Shop
                                         1)
                Inspector
                                         ø١
               Other
                  Sub Total-
                                                             Total-
                                                                        10)
 Serial Time To Complete: 300 min
                                                    Total Manhours (
                                                                       50.0)
 Automation Need: (Primary Key)
 Automatien Secondary Key(s)
                      Detailed Facility Resources
                                                            Crane Capacity:
                    Physical Size:
           Air Lock: 0 0 0 [W/D/H][ft]
Doors: 0 0 [W/H][ft]
High Bay: 70 100 85 [W/D/H][ft]
                                                     0 Ton
                                                                 0 Ft.Hook Height
                                                     0 Ton
                                                                 0 Ft.Hook Height
   Standard Commerical Power: Y
                                      Instrumentation Power [Uninterrupted]: Y
   Cleania : 100K
                                      E.C.S: Humidity:
                                            50 +/- 5 %
                                                                     70 +/--
   Closed Cuit Television: NA
                                      Power Cutoff: Y
                                                                Facility GN2: NA
   Fuel/Sager Disposal: N
                                      Helium Supply: NA
                                                                Shop Air: NA
   Fire Prection/Deluge(*): A
                                      Shower/Eye Wash: NA
                                                                Vacuum: NA
    Lighte protection: Y
                                      Potable Water: NA
                                                                Paging: Y
    Commercial Telephone: Y
                                      RF System(*): C
                                                                OIS: Y
    Person Airlock: Y
                                      Grounding: Y
                                                                Explosion Proof: NA
                     Detailed Equipment Resources
    Species Kit: NA
                                Slings: NA
                                                        OTV Adapter: NA
    Brecks: Y
                                Adapter Cables: Y
                                                        Ground Power Unit: Y
     AIT NA
                                Work Stands: Y
                                                        Special Hoisting Equip: NA
     NASA Mer: NA
                                OTV Canister: NA
                    (*) Legend For Data Input
     Fire Protection
                                                     RF System= A: S Band & C Band
                        or B: deluge
                                                             or B: Ku Band
                        or C: both
                                                             or C: both
                         or N: none
                                                             or N: none
            Stard Level:= 1: None
                                                      Others:= Y: Yes
                         or 2: Local Clear
                                                                N: No
                        or 3: Area Clear
                                                               NA: Not Applicable
                                                               TD: To Be Determined
                        or 4: Facility Clear
```

```
OTV SPACECRAFT INTEGRATION
        Task No: 12
                                 Description: <OTV S/C INTERFACE TEST
Subtask No: < 12.0600>
Hozord Level(+): 1 None
Activity: VERIFY MECHANICAL/ELECTRICAL INTERFACES BETWEEN OTV AND S/C
Personnel:
                                                     Control Station
                   Vehicle
             Payload Specialist(s)
                                                             0)
                                                             2)
2)
2)
             Engineering
                                      1)
                                      2)
              Shop
             Inspector
             Other
                Sub Total-
                                               4)-
                                                                    10
                                                         Total-
Serial Time To Complete: 120 min
                                                 Total Manhours (
                                                                   20.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                                                        Crane Capacity:
                  Physical Size:
                     0 0 0 [W/D/H][ft]
         Air Lock:
                                                  0 Ton
                                                             0 Ft. Hook Height
                                 [W/H][fi]
            Doors:
                          0
                   70 100 85 [W/D/H][ft]
         High Bay:
                                                  0 Ton
                                                             0 Ft. Hook Height
Standard Commercial Power: Y
                                    Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                            Temperature:
                                         50 +/- 5 %
                                                                 70 +/-
                                   Power Cutoff: Y
Closed Circuit Television: NA
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                                            Shop Air: NA
                                   Helium Supply: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                            Paging: Y
Commerical Telephone: Y
                                   RF System(*): C
                                                            OIS: Y
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: Y
                             Adapter Cables: Y
                                                    Ground Power Unit: Y
Air Pallet: NA
                             Work Stands: Y
                                                    Special Hoisting Equip: NA
                             OTV Canister: NA
NASA Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

```
OTV/SC/CITE INTERFACE TEST
         Task No: 13
Subtask No: < 13.0100> Description: <DATA PATH VERIFICATION Hazard Level(*): 1 None Activity: REMOVE PROTECTIVE COVERS, CONFIGURE OTV/SC CONNECTORS AND TEST SET,
VERIFY CONTINUITY/ISOLATION ACROSS ALL CONNECTORS, DEMATE, INSPECT CONNECTORS
Personnel:
                     Vehicle
                                                       Control Station
              Payload Specialist(s)
                                                                a)
                                                                2)
              Engineering
                                        2)
              Shop
              Inspector
              Other
                                      ( e)
                                                 4)-
                Sub Total-
                                                                        10)
                                                            Total-
Serial Time To Complete: 480 min
                                                   Total Manhours (
                                                                      80.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                     Detailed Facility Resources
                                                           Crane Capacity:
                   Physical Size:
                     0 0 0 [W/D/H][ft]
0 0 [W/H][ft]
          Air Lock:
                                                    0 Ton
                                                                0 Ft. Hook Height
             Doors:
          High Bay: 70 100 85 [W/D/H][ft]
                                                    0 Ton
                                                                @ Ft.Hook Height
Standard Commerical Power: Y
                                     Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                     E.C.S: Humidity:
                                                               Temperature:
                                           50 +/-
                                                                     70 +/-
                                     Power Cutoff: Y
Closed Circuit Television: NA
                                                               Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                     Helium Supply: NA
                                                               Shop Air: NA
Fire Protection/Deluge(*): A
                                     Shower/Eye Wash: NA
                                                               Vacuum: NA
Lightning Protection: Y
                                     Potable Water: NA
                                                               Paging: Y
Commerical Telephone: Y
                                     RF System(*): A
                                                               OIS: Y
Personnel Airlock: Y
                                     Grounding: Y
                                                               Explosion Proof: NA
                    Detailed Equipment Resources
Special Tool Kit: NA
                               Slings: NA
                                                       OTV Adapter: NA
Breakout Boxes: Y
                               Adapter Cables: Y
                                                       Ground Power Unit: Y
Air Pallet: NA
                               Work Stands: Y
                                                       Special Hoisting Equip: NA
NASA Conister: NA
                               OTV Canister: NA
                   (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                   RF System= A: S Band & C Band
                       or B: deluge
                                                            or B: Ku Band
or C: both
                       or C: both
                       or N: none
                                                            or N: none
          Hazard Level:= 1: None
                                                      Others:= Y: Yes
                       or 2: Local Clear
                                                               N: No
                       or 3: Area Clear
                                                              NA: Not Applicable
                       or 4: Facility Clear
                                                              TD: To Be Determined
```

Task No: 13 OTV/SC/CITE INTERFACE TEST Description: <FUNCTIONAL VERIFICATION OF RF > Subtask No: < 13.0200> Hazard Level(+): 1 None
Activity: CONFIGURE OTV/SC TO ASE/ORBITER CONNECTION(S), APPLY OTV GPS POWER INITIATE OTY/ORBITER DATA EXCHANGE, VERIFY RF LINK, ANALYZE DATA Personnel: Control Station Vehicle Payload Specialist(s) 0) 2) Engineering Shop Inspector 1) 0) Other Sub Total-4) Total-10) Total Manhours (200.0) Serial Time To Complete: 1200 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] 0 Ton Air Lock: 0 0 0 9 Ft. Hook Height Doors: 0 High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: Cleantiness: 100K Temperature: 50 +/-70 +/-Closed Circuit Television: NA Power Cutoff: Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Paging: Y Potable Water: NA Commercial Telephone: Y RF System(*): C OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: Y Adapter Cables: Y Ground Power Unit: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input RF System A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable TD: To Be Determined

```
CLOSEOUT & PREP TO MOVE
        Task No: 14
Subtask No: < 14.0100>
                                 Description: <PREP TO MOVE
Hozard Level(*): 1 None
Activity: DEMATE ELECTRICAL, INSPECT CONNECTORS, INSTALL PROTECTIVE COVERS/DEVICE
S-INSTALL OTV LIFTING SLING/FIXTURE-REMOVE ATTACH HARDWARE-POSITION TRANSPORTER
Personnel:
                     Vehicle
                                                     Control Station
             Payload Specialist(s)
                                                             0)
                                                             0
             Engineering
                                                             0
             Shop
                                      5)
                                                            ( e)
                                       2
              Inspector
                                      ē
             Other
                Sub Total-
                                               8)
                                                         Total.
Serial Time To Complete: 720 min
                                                 Total Manhours (
                                                                    96.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                        Crane Capacity:
                      0 0 0 [W/D/H][ft]
0 0 [W/H][ft]
          Air Lock:
                                                  0 Ton
                                                              9 Ft. Hook Height
             Doors:
                     70 100 85 [W/D/H][ft]
         High Bay:
                                                 20 Ton
                                                             70 Ft. Hook Height
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                             Temperature:
                                         50 +/-
                                                                  70 +/-
Closed Circuit Television: NA
                                    Power Cutoff: NA
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                                             Shop Air: NA
                                    Helium Supply: NA
                                    Shower/Eye Wash: NA
Fire Protection/Deluge(*): A
                                                             Vacuum: NA
Lightning Protection: Y
                                    Potable Water: NA
                                                             Paging: Y
                                    RF System(*): N
Commercial Telephone: Y
                                                             OIS: NA
Personnel Airlock: Y
                                   'Grounding: Y
                                                             Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: Y
                              Slings: Y
                                                    OTV Adapter: Y
Breakout Boxes: NA
                              Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                              Work Stands: Y
                                                    Special Hoisting Equip: Y
NASA Canister: NA
                              OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                          or B: Ku Band
                      or C: both
                                                          or C: both
                      or N: none
                                                          or N: none
          Hazard Level:= 1: None
                                                    Others:= Y: Yes
                      or 2: Local Clear
                                                             N: No
                      or 3: Area Clear
                                                            NA: Not Applicable
                                                            TD: To Be Determined
                      or 4: Facility Clear
```

Task No: 15 INSTALL IN CANISTER Subtask No: < 15.0100> Description: <INSTALL OTV S/C IN CANISTER Hazard Level(*): 2 Local Clear Activity: USING THE VPHD, LOAD THE ASSEMBLED OTV AND S/C INTO THE CANISTER FOR TRANSPORT Personnel: **Control Station** Vehicle Payload Specialist(s) (0) 0) 0) Engineering 5) 0 Shop Inspector 0) Other Sub Total-8)-Total-32.0) Serial Time To Complete: 240 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(8) **Detailed Facility Resources** Physical Size: Crane Capacity: 40 40 74 [W/D/H][ft] 35 71 [W/H][ft] Air Lock: 10 Ton 64 Ft. Hook Height Doors: High Bay: 70 100 85 [W/D/H][ft] 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Temperature: Cleanliness: 100K E.C.S: Humidity: 50 +/- 5 % 70 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Shop Air: NA Helium Supply: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Grounding: Y Personnel Airlock: Y Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: Y OTV Adapter: Y Slings: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: Y NASA Conister: Y OTV Conister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

7

INSTALL IN CANISTER Task No: 15 Subtask No: < 15.0200> Descriptorard Level(*): 1 None Activity: TRANSPORT OTV AND S/C TO PAD Description: <TRANSPORT CANISTER TO PAD Personnel: Vehicle Control Station Payload Specialist(s) Ø) 0) Engineering Shop 3) 0 Inspector ΘÌ Other Sub Total-5) Total Serial Time To Complete: 240 min Total Manhours (20.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] Air Lock: 0 Ø 0 Ton **0** Ft.Hook Height Doors: Ø 0 (W/H][ft] 0 . 0 [W/D/H][ft] High Bay: 0 Ton **0** Ft. Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleantiness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Vacuum: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: NA Grounding: Y **Explosion Proof: NA** Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: Y OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 16 INSTALL IN RSS PGHM Subtask No: < 16.0100> Description: SMATE CANISTER TO PCR Hazard Level(*): 2 Local Clear Activity: USING MASE AND O/H CRANE LIFT THE CANISTER FROM TRANSPORTER TO THE PCR. Personnel: Control Station Vehicle Payload Specialist(s) Ø) 0) Engineering 1) 5) Shop e) Ð) Inspector Other e) Sub Total-8). Total-Serial Time To Complete: 360 min 48.Ó) Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] 0 Ton Air Lock: 0 0 Ft. Hook Height Doors: B 0 [W/D/H][ft] High Bay: 0 0 0 Ton **6** Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: NA Grounding: Y Explosion Proof: NA Detailed Equipment Resources OTV Adapter: NA Special Tool Kit: NA Slings: NA Breakout Boxes: NA Ground Power Unit: NA Adapter Cables: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: Y OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Bond or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

or 4: Facility Clear

INSTALL IN RSS PGHM Task No: 16 Subtask No: < 16.0200> Description: <REMOVE OTV S/C FROM CANISTER Hazard Level(*): 2 Local Clear Activity: OPEN CANISTER-TRANSFER OTV AND S/C FROM CANISTER TO PGHM FOR PAD Description: <REMOVE OTV S/C FROM CANISTER > **OPERATIONS** Personnel: Vehicle **Control Station** Payload Specialist(s) 0) 0) Engineering 1) 5) Shop 0 e) Inspector ē) Other Sub Total-8). Total-Serial Time To Complete: 240 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] [W/H][ft] Air Lock: Ø 0 Ton 0 0 Ft.Hook Height 0 Doors: 0 0 [W/D/H][ft] High Bay: 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % Power Cutoff: NA 70 +/-Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y **Explosion Proof: NA Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

or 4: Facility Clear

```
INSTALL BATTERIES AND ORDNANCE
        Task No: 17
Subtask No: < 17.0100>
Hazard Level(*): 1 None
                                 Description: <CONNECT BATT/ORD TEST SET
Activity: CONNECT TEST SET TO VERIFY BATTERY AND ORDNANCE INSTALLATION
Personnel:
                     Vehicle
                                                     Control Station
             Payload Specialist(s)
                                                             0)
              Engineering
                                                             0)
                                      4)
             Shop
                                                             0)
                                                             ĕ۵
              Inspector
              Other
                                      9)
                Sub Total-
                                              7)-
                                                         Total-
Serial Time To Complete:
                            60 min
                                                 Total Manhours (
                                                                    7.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                                                        Crane Capacity:
                  Physical Size:
         Air Lock:
                      0 0
                              0 [W/D/H][ft]
                                                  0 Ton
                                                             0 Ft. Hook Height
            Doors:
                      0
                          0
                                 [W/H][ft]
                              0 [W/D/H][ft]
         High Boy:
                      0
                          Ð
                                                  0 Ton
                                                             @ Ft.Hook Height
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: Y
Cieanliness: 100K
                                    E.C.S: Humidity:
                                                            Temperature:
                                         50 +/- 5 %
                                                                           5 F
                                                                 70 +/-
Closed Circuit Television: NA
                                   Power Cutoff: Y
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A
                                                            Vacuum: NA
                                   Shower/Eye Wash: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                            Paging: Y
Commercial Telephone: Y
                                   RF System(*): N
                                                            OIS: NA
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Conister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
          Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                                                           NA: Not Applicable
                      or 3: Area Clear
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

INSTALL BATTERIES AND ORDNANCE Task No: 17 Subtask No: < 17.0200> Description: <INSTALL BATTERIES Hazard Level(+): 1 None Activity: REMOVE THE ACCESS PANELS-INSTALL BATTERIES-PERFORM THE BATTERY TEST PROCEDURE-CLOSE THE ACCESS PANELS. Personnel: **Control Station** Vehicle Payload Specialist(s) 0) A) Engineering 1) 0 Shop 4) 2 2 3 0 0 3 Inspector e١ Other Sub Total-7) Total-Serial Time To Complete: 180 min Total Manhours (21.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] 0 0 0 Ton 0 Ft.Hook Height Air Lock: 0 Doors: a а High Bay: 0 [W/D/H][ft] 0 Ton 0 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % 70 +/-Closed Circuit Television: NA Power Cutoff: Y Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

or 4: Facility Clear

TD: To Be Determined

INSTALL BATTERIES AND ORDNANCE Task No: 17 Subtask No: < 17.0300> Description: <INSTALL ORDNANCE Hazard Level(*): 3 Area Clear Activity: REMOVE ACCESS PANELS-PERFORM STATIC VOLTAGE CHECKS-INSTALL ORDNANCE-PERFORM STATIC VOLTAGE CHECKS-ELECTRICAL CONNECT SQUIBS-REPLACE ACCESS PANELS. Personnel: Control Station Vehicle Payload Specialist(s) 0) 0) Engineering 4) 0) Shop ē١ Inspector Other ΘÌ Sub Total-7)-Total Serial Time To Complete: 360 min Total Manhours (42.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: 0 0 [W/D/H][ft] Ø Ton 0 Ft. Hook Height [M/H][[t] a a Doors: High Bay: 0 0 0 [W/D/H][ft] 0 Ton 0 Ft. Hook Height Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-5 F Facility GN2: NA Closed Circuit Television: NA Power Cutoff: Y Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

INSTALL BATTERIES AND ORDNANCE Task No: 17 Subtask No: < 17.0400> Description: <DISCONNECT BATT/OF Hozord Level(*): 2 Local Clear Activity: DISCONNECT TEST SET-INSPECT AND VERIFY ALL CONNECTORS Description: <DISCONNECT BATT/ORD TEST SET > Personnel: Vehicle **Control Station** Payload Specialist(s) (0) 0) (1) (4) (2) (0) Engineering 0) 0) Shop ΘŚ Inspector Other Sub Total-7) Total-Serial Time To Complete: 120 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] 0 0 [W/H][ft] 0 Ton 0 Ft.Hook Height Air Lock: Doors: 0 [W/D/H][ft] High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-5 F Closed Circuit Television: NA Power Cutoff: Y Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y OIS: NA Commercial Telephone: Y RF System(*): N Grounding: Y Personnel Airlock: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No NA: Not Applicable TD: To Be Determined or 3: Area Clear or 4: Facility Clear

```
Task No: 17
                            INSTALL BATTERIES AND ORDNANCE
                                 Description: <PERFORM POWER TRANSFER CHECKS >
Subtask No: < 17.0500>
Hazard Level(*): 2 Local Clear
Activity: PERFORM OTV POWER ON TEST-TRANSFER POWER TO BATTERY POWER-PERFORM
BATTERY POWER CHECKS-TRANSFER POWER TO GPU POWER.
Personnel:
                                                     Control Station
                     Vehicle
             Payload Specialist(s)
                                                             Ø)
                                                             2)
             Engineering
                                       1)
                                      2)
             Shop
             Inspector
                                      1)
                                      ø)
             Other
               Sub Total-
                                                         Total-
Serial Time To Complete: 120 min
                                                 Total Manhours (
                                                                   20.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                        Crane Capacity:
                          0
                              0 [W/D/H][ft]
                                                  0 Ton
         Air Lock:
                      Ø
                                                             0 Ft. Hook Height
                              [W/H][ft]
Ø [W/D/H][ft]
                      Ø
                          0
            Doors:
         High Bay:
                          0
                                                             0 Ft.Hook Height
                      0
                                                  0 Ton
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                             Temperature:
                                         50 +/- 5 %
                                                                  70 +/-
                                   Power Cutoff: Y
Closed Circuit Television: NA
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                                            Shop Air: NA
                                   Helium Supply: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                            Paging: Y
Commercial Telephone: Y
                                   RF System(*): A
                                                            OIS: Y
Personnel Airlock: Y
                                   Grounding: Y
                                                             Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: NA
                                                    OTV Adapter: NA
                             Slings: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
or C: both
                                                         or B: Ku Band
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                                                           NA: Not Applicable
TD: To Be Determined
                      or 3: Area Clear
                      or 4: Facility Clear
```

Task No: 18 LOAD OTV RCS Subtask No: < 18.0100> Description: <CONNECT RCS CART TO TANK FILL > Hazard Level(*): 1 None Activity: CONNECT RCS CART TO TANK FILL FITTINGS-VERIFY TORQUE PER INSPECTION KIT SPECIFICATIONS Personnel: Control Station Vehicle Payload Specialist(s) 0) 0) Ð) Engineering 2) 1) Shop 0 e١ Inspector 0) Other Sub Total-4) Total Serial Time To Complete: 120 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: [W/D/H][ft] 0 Ton Air Lock: 0 0 0 0 Ft.Hook Height [W/H][ft] Doors: High Boy: Ø [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-5 F Power Cutoff: Y Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(+): A Shower/Eye Wash: Y Vacuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commercial Telephone: Y RF System(*): A OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
LOAD OTV RCS
        Task No: 18
Subtask No: < 18.0200>
                                 Description: <FILL RCS TANKS
Hazard Level(*): 4 Facility Clear
Activity: COMMAND START OF FILL OPERATIONS-VERIFY PRESSURE/TEMP DATA
Personnel:
                    Vehicle
                                                    Control Station
             Payload Specialist(s) (
                                      Ø)
                                                            O)
                                                            0)
             Engineering
             Shop
                                      2)
                                                            0)
                                      1)
                                                            ø)
             Inspector
             Other
                                      8)
               Sub Total-
                                                        Total-
Serial Time To Complete: 120 min
                                                Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                       Crane Capacity:
                                [W/D/H][ft]
                                                 0 Ton
         Air Lock:
                     0
                         0
                                                            0 Ft.Hook Height
                                 W/H][ft]
            Doors:
         High Boy:
                              0 [w/D/H][ft]
                                                            0 Ft.Hook Height
                          a
                                                 0 Ton
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                   E.C.S: Humidity:
                                                            Temperature:
                                   50 +/- 5 %
Power Cutoff: Y
                                                                70 +/-
                                                            Facility GN2: NA
Closed Circuit Television: NA
Fuel/Oxidizer Disposal: Y
                                                           Shop Air: NA
                                   Helium Supply: NA
                                   Shower/Eye Wash: Y
Fire Protection/Deluge(*): A
                                                           Vacuum: NA
Lightning Protection: Y
                                   Potable Water: Y
                                                           Paging: Y
Commercial Telephone: Y
                                                           OIS: Y
                                   RF System(*): A
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: Y
                  Detailed Equipment Resources
Special Tool Kit: Y
                             Slings: NA
                                                   OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                   Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                   Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                        or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                        or N: none
                                                  Others:= Y: Yes
         Hazard Level:= 1: None
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

```
LOAD OTV RCS
        Task No: 18
                                 Description: <DISCONNECT RCS CART
Subtask No: < 18.0300>
Hazard Level(*): 4 Facility Clear
Activity: DISCONNECT RCS FLEX LINES-DISCONNECT RCS CART
Personnel:
                                                     Control Station
                     Vehicle
             Payload Specialist(s) (
             Engineering
                                                             ø
                                                             ١٥
                                      2)
1)
             Shop
                                                             ø)
              Inspector
             Other
                                      ΘŚ
               Sub Total-
                                              4).
                                                         Total-
Serial Time To Complete: 120 min
                                                 Total Manhours (
                                                                    8.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                        Crane Capacity:
                              0 [W/D/H][ft]
[W/H][ft]
0 [W/D/H][ft]
                      0 0
                                                  Ø Ton
         Air Lock:
                                                             0 Ft. Hook Height
                      0
                          ø
            Doors:
         High Bay:
                      0
                          0
                                                  Ø Ton
                                                             9 Ft.Hook Height
                                   Instrumentation Power [Uninterrupted]: Y
Standard Commerical Power: Y
                                    E.C.S: Humidity:
Cleanliness: 100K
                                                            Temperature:
                                         50 +/- 5 %
                                                                  70 +/-
Closed Circuit Television: NA
                                   Power Cutoff: Y
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: Y
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: Y
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: Y
                                                            Paging: Y
Commerical Telephone: Y
                                   RF System(*): A
                                                            OIS: Y
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: Y
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
          Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                            TD: To Be Determined
```

Task No: 18 LOAD OTV RCS Subtask No: < 18.0400> Description: <PREP FOR ORBITER INSTALLATION > Hazard Level(*): 1 None Activity: PREP OTV FOR INSTALLATION INTO ORBITER-DISCONNECT OTV ELECTICALLY AND MECHANICALLY. WALK DOWN INSPECTION AND PHOTOGRAPH. Personnel: **Control Station** Vehicle Payload Specialist(s) Engineering e) 4) ø' Shop ē Inspector Other Sub Total-7). Total-Serial Time To Complete: 480 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: [W/D/H][ft] [W/H][ft] 0 0 Ton 0 Ft. Hook Height Air Lock: 0 0 Doors: Ø ø 0 [W/D/H][ft] High Boy: 0 0 Ton 0 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/-70 +/-Power Cutoff: Y Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y OIS: Y RF System(*): A Personnel Airlock: Y Groundina: Y Explosion Proof: Y Detailed Equipment Resources Special Tool Kit: NA OTV Adapter: NA Slings: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pollet: NA Work Stands: NA Special Hoisting Equip: NA OTV Canister: NA NASA Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
INSTALL PAYLOAD IN ORBITER
        Task No: 19
Subtask No: < 19.0100>
Hazard Level(*): 2 Local Clear
                                 Description: <INSTALL PAYLOAD IN ORBITER
Activity: INSTALL PAYLOAD IN ORBITER PAYLOAD BAY USING PGHM
Personnel:
                                                     Control Station
                    Vehicle
             Payload Specialist(s) (
                                                             0)
             Engineering
                                                             0
                                      1)
                                      5)
2)
                                                             0
             Shop
                                                             e١
             Inspector
                                      0)
             Other
                                               8)-
               Sub Total-
                                                                      8)
                                                         Total-
                                                                    32. é)
Serial Time To Complete: 240 min
                                                 Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                        Crane Capacity:
                              0 [W/D/H][ft]
[W/H][ft]
                          0
                                                  0 Ton
         Air Lock:
                      0
                                                             0 Ft. Hook Height
            Doors:
                      a
                          0
                              0 [W/D/H][ft]
         High Bay:
                      0
                          0
                                                              0 Ft. Hook Height
                                                  0 Ton
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                             Temperature:
                                         50 +/- 5 %
                                                                  70 +/~
                                                             Facility GN2: NA
Closed Circuit Television: NA
                                    Power Cutoff: NA
Fuel/Oxidizer Disposal: N
                                    Helium Supply: NA
                                                             Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                             Vacuum: NA
Lightning Protection: Y
                                    Potable Water: NA
                                                             Paging: Y
Commerical Telephone: Y
                                    RF System(*): N
                                                             OIS: Y
Personnel Airlock: Y
                                    Grounding: Y
                                                             Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: Y
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                    Special Hoisting Equip: NA
NASA Conister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                          or B: Ku Band
                      or C: both
                                                          or C: both
                      or N: none
                                                          or N: none
                                                   Others:= Y: Yes
         Hazard Level:= 1: None
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                            NA: Not Applicable
                     or 4: Facility Clear
                                                            TD: To Be Determined
```

```
Task No: 19
                            INSTALL PAYLOAD IN ORBITER
                                 Description: CMATE ELEC, MECH SERVICE LINES >
Subtask No: < 19.0200>
Hazard Level(*): 2 Local Clear
Activity: CONNECT ALL ELECTRICAL AND MECHANICAL FLUID CONNECTIONS REQUIRED
FOR LAUNCH.
Personnel:
                                                     Control Station
                     Vehicle
             Payload Specialist(s) (0)
                                                              0
             Engineering
                                       1)
             Shop
                                       4)
                                                              0
                                       25
                                                              0)
              Inspector
             Other
                                       0)
               Sub Total-
                                               7)-
                                                          Total-
Serial Time To Complete: 180 min
                                                 Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                         Crane Capacity:
                                 [W/D/H][ft]
[W/H][ft]
                                                   0 Ton
         Air Lock:
                      0
                          0
                              0
                                                              0 Ft. Hook Height
            Doors:
                      ø
                          Ø
                                 [W/D/H][ft]
         High Bay:
                      Ø
                          0
                                                   0 Ton
                                                              0 Ft. Hook Height
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: NA
                                    E.C.S: Humidity:
Cleanliness: 100K
                                                             Temperature:
                                         50 +/- 5 %
                                                                            5 F
                                                                  70 +/-
Closed Circuit Television: NA
                                    Power Cutoff: NA
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                    Helium Supply: NA
                                                             Shop Air: NA
Fire Protection/Deluge(*): A
                                    Shower/Eye Wash: NA
                                                             Vacuum: NA
Lightning Protection: Y
                                    Potable Water: NA
                                                             Paging: Y
Commercial Telephone: Y
                                    RF System(*): N
                                                             OIS: Y
Personnel Airlock: Y
                                    Grounding: Y
                                                             Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: Y
                              Slings: NA
                                                     OTV Adapter: NA
Breakout Boxes: NA
                              Adapter Cables: NA
                                                     Ground Power Unit: NA
Air Pallet: NA
                              Work Stands: NA
                                                     Special Hoisting Equip: NA
NASA Conister: NA
                              OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                  RF System= A: S Band & C Band
                      or B: deluge
                                                          or B: Ku Band
                      or C: both
                                                          or C: both
                      or N: none
                                                          or N: none
          Hazard Level:= 1: None
                                                    Others:= Y: Yes
                      or 2: Local Clear
                                                             N: No
                      or 3: Area Clear
                                                            NA: Not Applicable
                      or 4: Facility Clear
                                                            TD: To Be Determined
```

Task No: 20 P/L ORBITER I/F VERIFICATION Subtask No: < 20.0100> Hazard Level(*): 1 None Description: <POWER UP ORBITER Activity: APPLY ORBITER POWER PER EPDC PROCEDURES Personnel: Vehicle Control Station Payload Specialist(s) 0) 1) 0) Engineering 0) Shop 0) 0) Inspector 0) Ø ē) Other Sub Total-1) Total-Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] 0 Ton Air Lock: 0 0 0 **9** Ft.Hook Height Doors: 0 [w/H][ft] High Bay: 0 0 [W/D/H][ft] 0 Ton **0** Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-70 +/-Power Cutoff: Y Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y OIS: Y RF System(*): N Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA OTV Canister: NA NASA Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

P/L ORBITER I/F VERIFICATION Task No: 20 Subtask No: < 20.0200> Description: <POWER UP PAYLOAD > Hazard Level(*): 1 None Activity: APPLY OTV AND SPACECRAFT POWER-PERFORM TELEMETRY CHECKS. Personnel: **Control Station** Vehicle Payload Specialist(s) 2) 2) 2) Engineering 2) Shop Inspector e١ Other Sub Total-4)-Total-10) Serial Time To Complete: 180 min Total Manhours (30.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] 0 Ton 8 Air Lock: 0 9 Ft. Hook Height Doors: 0 High Bay: 0 [W/D/H][ft] ø B 0 Ton 0 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Power Cutoff: Y Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Potable Water: NA Lightning Protection: Y Paging: Y Commercial Telephone: Y RF System(*): C OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y Detailed Equipment Resources Special Tool Kit: NA OTV Adapter: NA Slings: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA OTV Canister: NA NASA Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

```
P/L ORBITER I/F VERIFICATION
        Task No: 20
                                Description: <PERFORM CMD TEST VIA MCDS
Subtask No: < 20.0300>
Hazard Level(+): 1 None
Activity: ISSUE COMMANDS FROM ORBITER MCDS-VERIFY RESPONSE VIA ORBITER
TELEMETRY
Personnel:
                                                    Control Station
                    Vehicle
             Payload Specialist(s)
                                                            0)
                                                            2
             Engineering
                                      1)
                                                            2
                                     2)
             Shop
                                      1)
             Inspector
                                    \ e)
             Other
               Sub Total
                                              4).
                                                        Total
Serial Time To Complete: 240 min
                                                Total Manhours (
                                                                   40.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                                                       Crane Capacity:
                 Physical Size:
                             0 [W/D/H][ft]
[W/H][ft]
                                                 0 Ton
         Air Lock:
                      0 0
                                                            0 Ft.Hook Height
                          a
            Doors:
                      a
         High Bay:
                              0 [W/D/H][ft]
                                                 Ø Ton
                     0
                         0
                                                             9 Ft. Hook Height
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                   E.C.S: Humidity:
                                                            Temperature:
                                        50 +/- 5 %
                                                                 70 +/-
Closed Circuit Television: NA
                                   Power Cutoff: Y
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                            Paging: Y
Commercial Telephone: Y
                                   RF System(*): C
                                                            OIS: Y
                                   Grounding: Y
Personnel Airlock: Y
                                                            Explosion Proof: Y
                  Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                   OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                   Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                   Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                RF System= A: S Band & C Band
                      or B: deluge
                                                        or B: Ku Band
                      or C: both
                                                        or C: both
                      or N: none
                                                        or N: none
         Hazard Level:= 1: None
                                                  Others:= Y: Yes
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
```

TD: To Be Determined

P/L ORBITER I/F VERIFICATION Task No: 20 Subtask No: < 20.0400> Descrip Hazard Level(*): 1 None Activity: PERFORM PAYLOAD HEALTH CHECKS Description: <OTV SPACECRAFT HEALTH CHECKS > Personnel: **Control Station** Vehicle Payload Specialist(s) 0) Engineering 2 2 Shop 2) Inspector 0) Other Sub Total-Total-Serial Time To Complete: 120 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: [W/D/H][ft] 0 Ton 6 Ft. Hook Height Doors: ø W/H][ft 0 [W/D/H][ft] High Bay: 0 0 Ton @ Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cieanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % Power Cutoff: Y 70 +/-Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y RF System(*): C Commercial Telephone: Y OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Conister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

SPACECRAFT POCC TEST Task No: 21 Subtask No: < 21.0100> Description: <ISSUE S/C COMMANDS FROM POCC > Hazard Level (+): 1 None Activity: ISSUÉ COMMANDS FROM POCC VIA TDRSS-KSC TELEMETRY-ORBITER COMMAND AND DATA SYSTEM. Personnel: Control Station Vehicle Payload Specialist(s) 2 2 2 Engineering 2) Shop Inspector \ e3 Other Sub Total-Total. Serial Time To Complete: 240 min Total Manhours (40.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] 0 0 Ton ø Air Lock: 0 Ft. Hook Height Doors: 0 0 0 [W/D/H][ft] High Bay: 0 Ton 9 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % 70 +/-Facility GN2: NA Power Cutoff: Y Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): C OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

or 4: Facility Clear

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Task No: 21
                            SPACECRAFT POCC TEST
                                 Description: <VERIFY SPACECRAFT RESPONSE
Subtask No: < 21.0200>
Hazard Level(*): 1 None
Activity: VERIFY POCC IS ABLE TO ISSUE COMMANDS TO THE SPACECRAFT AND RECIEVE
PROPER RESPONSE.
Personnel:
                                                    Control Station
                    Vehicle
             Payload Specialist(s)
                                                            a)
                                                            2)
             Engineering
                                      2)
             Shop
             Inspector
                                      0)
             Other
               Sub Total-
                                                        Total-
                                                                    10)
Serial Time To Complete: 120 min
                                                                   20.0)
                                                Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                       Crane Capacity:
         Air Lock:
                      0
                         0
                                [W/D/H][ft]
                                                 0 Ton
                                                             0 Ft. Hook Height
                              0
                                [w/H][ft]
            Doors:
                      A
                          ø
         High Bay:
                                [W/D/H][ft]
                                                 0 Ton
                                                             0 Ft. Hook Height
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                   E.C.S: Humidity:
                                                            Temperature:
                                   50 +/- 5
Power Cutoff: Y
                                                                 70 +/-
                                                            Facility GN2: NA
Closed Circuit Television: NA
Fuei/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                            Paging: Y
Commercial Telephone: Y
                                                            OIS: Y
                                   RF System(*): C
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: Y
                  Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                   OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                   Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                   Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                RF System= A: S Band & C Band
                      or B: deluge
                                                        or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
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SPACECRAFT POCC TEST Task No: 21 Subtask No: < 21.0300> Hazard Level(*): 1 None Description: <POWER DOWN SPACECRAFT Activity: REMOVE POWER FROM SPACECRAFT. Personnel: Vehicle Control Station Payload Specialist(s) 0) 2) Engineering 2) 2) 1) Shop Inspector 0) Other Sub Total-Total-Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] Air Lock: 0 Ton 0 Ft.Hook Height 0 Doors: 0 0 [W/D/H][ft] High Bay: 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % Power Cutoff: Y 70 +/-Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): C OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No NA: Not Applicable or 3: Area Clear or 4: Facility Clear TD: To Be Determined

Task No: 22 FINAL PAYLOAD CLOSEOUT Subtask No: < 22.0100> Hazard Level(*): 1 None Description: <REMOVE BEFORE FLIGHT ITEMS Activity: REMOVE ALL REMOVE BEFORE FLIGHT ITEMS Personnel: Vehicle Control Station Payload Specialist(s) 0) Engineering 0 2) Shop 0 Inspector e) Other Sub Total-Total-Serial Time To Complete: 240 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] Air Lock: @ Ton 0 Ft. Hook Height Doors: Ø 0 [W/D/H][ft] High Boy: Ð ø 0 Ton 9 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % Power Cutoff: Y 5 F 70 +/-Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Heliuma Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Potable Water: NA Lightning Protection: Y Pagina: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: Y Detailed Equipment Resources Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

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Task No: 22 FINAL PAYLOAD CLOSEOUT Subtask No: < 22.0200> Hazard Level(*): 1 None Description: <APPLY POWER TO SPACECRAFT Activity: APPLY POWER TO THE SPACECRAFT Personnel: Vehicle Control Station Payload Specialist(s) 0) e) Engineering 0) 0) Shop 0) 0) ø) e١ Inspector Other Ø) Sub Total-0)-Total. Serial Time To Complete: 240 min Total Manhours (0.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] Air Lock: 0 0 0 Ton 0 Ft.Hook Height [W/H][ft] 0 [W/D/H][ft] Doors: 0 0 High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % 70 +/-Power Cutoff: Y Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y RF System(*): N Commerical Telephone: Y OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adopter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: Ku Band or B: deluge or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 22 FINAL PAYLOAD CLOSEOUT Subtask No: < 22.0300> Description: <COMMAND : Hazard Level(*): 1 None Activity: SECURE SPACECRAFT SYSTEMS IN PRE-LAUNCH MODE Description: <COMMAND S/C TO PRE-LAUNCH MODE> Personnel: **Control Station** Vehicle Payload Specialist(s) 8) θ) Engineering 0) Shop θ) 0 9) 6) Inspector (ē) Other Sub Total-8) Total-Serial Time To Complete: 30 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] Air Lock: 0 Ton 9 Ft. Hook Height Doors: Ø [W/H][ft] High Bay: 0 0 [W/D/H][ft] 0 0 Ft.Hook Height 0 Ton Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5
Power Cutoff: Y 70 +/-5 % Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y OIS: Y RF System(*): N Explosion Proof: Y Personnel Airlock: Y Grounding: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear or 3: Area Clear N: No NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 22 FINAL PAYLOAD CLOSEOUT Description: <REMOVE POWER FROM SPACECRAFT > Subtask No: < 22.0400> Hazard Level(*): 1 None Activity: REMOVE SPACECRAFT POWER Personnel: **Control Station** Vehicle Payload Specialist(s) Engineering 0) 0 ø) 0) Shop Inspector 0) Ø) \ ĕ\$ Other Sub Total-0). Total: Serial Time To Complete: Total Manhours (60 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 0 Ton 0 Ft.Hook Height Doors: A A High Bay: 0 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 9 70 +/-Facility GN2: NA Closed Circuit Television: Y Power Cutoff: Y Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Conister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

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Task No: 22
                            FINAL PAYLOAD CLOSEOUT
Subtask No: < 22.0500>
                                 Description: <ENGR INSPECT/FINAL CLOSEOUT >
Hazard Level(+): 1 None
Activity: PERFORM WALKDOWN INSPECTION OF OTV FOR FINAL PAYLOAD BAY
CLOSEOUT.
Personnel:
                     Vehicle
                                                     Control Station
             Payload Specialist(s)
                                                             0)
                                      2)
2)
                                                             0
             Engineering
                                                             ΘÌ
             Shop
              Inspector
                                                             0)
             Other
                                      0)
               Sub Total-
                                              5)-
                                                         Total-
                                                                    5.0)
Serial Time To Complete:
                                                Total Manhours (
                            60 min
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                        Crane Capacity:
                                [W/D/H][ft]
         Air Lock:
                     0
                          0
                                                 0 Ton
                                                             0 Ft.Hook Height
                              0
            Doors:
                      0
                              [W/H][ft]
0 [W/D/H][ft]
         High Bay:
                                                  0 Ton
                                                             0 Ft.Hook Height
Standard Commerical Power: Y
                                   Instrumentation Power [Uninterrupted]: Y
Cleanliness: 100K
                                   E.C.S: Humidity:
                                                            Temperature:
                                        50 +/-
                                                                 70 +/-
                                                                          5 F
                                                            Facility GN2: NA
Closed Circuit Television: NA
                                   Power Cutoff: Y
Fuel/Oxidizer Disposal: N
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): A .
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: Y
                                   Potable Water: NA
                                                            Paging: Y
Commercial Telephone: Y
                                   RF System(*): C
                                                            OIS: NA
Personnel Airlock: Y
                                   Grounding: Y
                                                            Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: NA
                                                    OTV Adapter: NA
                             Slings: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
                                                   Others:= Y: Yes
         Hazard Level:= 1: None
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

Task No: 23 LAUNCH PREPARATIONS Subtask No: < 23.0100> Description: <APPLY POWER TO OTV Hazard Level(*): 1 None Activity: APPLY POWER TO OTV IN PREPARATION FOR LAUNCH Personnel: Vehicle Control Station Payload Specialist(s) Engineering Shop 2) Inspector 1) θŚ Other Sub Total-4). Total-10) Serial Time To Complete: 120 min Total Manhours (20.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 0 [W/D/H][ft] Air Lock: 0 Ton 0 Ft.Hook Height Doors: 0 W/H][ft 0 [W/D/H][ft] High Bay: 0 6 Ft. Hook Height 0 Ton Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-70 +/-Closed Circuit Television: NA Power Cutoff: Y Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(+): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): A OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

or 4: Facility Clear

TD: To Be Determined

LAUNCH PREPARATIONS Task No: 23 Description: <LOAD/MONITOR CRYO Subtask No: < 23.0200> Hazard Level(*): 4 Facility Clear Activity: LOAD CRYO AND MONITOR FOR PRESSURE AND VOLUME (INCLUDE FUEL CELLS) Personnel: Control Station Vehicle Payload Specialist(s) 2) 2) 2) Engineering e١ e) Shop Inspector 0 e۶ Other Sub Total-0). Total-Serial Time To Complete: 120 min Total Manhours (12.0) Automation Need: (Primary Key). Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] 0 0 Ton 0 Ft.Hook Height Air Lock: 0 Doors: 0 0 High Bay: 0 0 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/-70 +/-Power Cutoff: Y Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Paging: Y Lightning Protection: Y Potable Water: NA Commercial Telephone: Y RF System(*): C OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA OTV Canister: NA NASA Conister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: Ku Band or B: deluge or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 23 LAUNCH PREPARATIONS Subtask No: < 23.0300> Description: <ACTIVATE/LOAD TEST FUEL CELLS > Hazard Level(*): 2 Local Clear Activity: TRANSFER LOAD FROM ORBITER POWER TO OTV FUEL CELL-VERIFY ALL LOAD **PARAMETERS** Personnel: **Control Station** Vehicle Payload Specialist(s) (0) 0) Engineering 0) 2) 0) 2) 2) Shop Inspector 0) 8 Other Sub Total-0) Total-Serial Time To Complete: 120 min Total Manhours (12.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: Air Lock: 0 0 0 [W/D/H][ft] 0 Ton 0 Ft. Hook Height Doors: 0 [W/H][ft] 0 [W/D/H][ft] High Bay: 0 Ø 0 Ton 0 Ft.Hook Height Instrumentation Power [Uninterrupted]: Y Standard Commerical Power: Y E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % 70 +/-Power Cutoff: Y Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): C OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Ground Power Unit: NA Adapter Cables: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No NA: Not Applicable or 3: Area Clear or 4: Facility Clear TD: To Be Determined

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LAUNCH PREPARATIONS Task No: 23 Subtask No: < 23.0400> Description: <LAUNCH Hazard Level(+): 4 Facility Clear Activity: LAUNCH Personnel: Vehicle Control Station Payload Specialist(s) 0)222 0) Engineering Shop 0 ē Inspector 0) Other Sub Total-0) Total-Serial Time To Complete: 180 min Total Manhours (18.6) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: [W/D/H][ft] 0 Ton 0 Ft. Hook Height Doors: [W/D/H][ft] 0 Ton 0 Ft.Hook Height High Bay: Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: E.C.S: Humidity: Temperature: 0 +/- 0 % 0 +/-Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): N OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: Y Detailed Equipment Resources Special Tool Kit: NA OTV Adapter: NA Slings: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or C: both or B: Ku Band or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No

NA: Not Applicable

TD: To Be Determined

or 3: Area Clear

or 4: Facility Clear

Task No: 24 DEPLOY OTV/SPACECRAFT Subtask No: < 24.0100> Description: <OPEN CARGO BAY DOOR Hazard Level(*): 1 None Activity: OPEN CARGO BAY IN PREPARATION OF PLACING OTC/SC IN LEO Description: <OPEN CARGO BAY DOORS Personnel: Control Station Vehicle Payload Specialist(s) 0) e) Engineering Shop ø) ø, ø) 0) Inspector eΣ Other Sub Total-1) Total-Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] 0 Ton Air Lock: 0 ø 0 0 Ft. Hook Height Doors: 0 0 [W/H][ft] 0 [W/D/H][ft] High Bay: 0 0 Ton **0** Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: **0**K E.C.S: Humidity: Temperature: 0 +/- 0 % 0 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA OTV Adapter: NA Slings: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 24 DEPLOY OTV/SPACECRAFT Subtask No: < 24.0200> Description: <POWER UP SPACECRAFT Hazard Level(*): 1 None Activity: COMMAND THE SPACECRAFT POWER ON. Personnel: Control Station Vehicle Payload Specialist(s) Engineering 0) 2 2) 0) Shop Inspector O) Other 0) Sub Total-1) Total-Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 [W/D/H][ft] 0 Ton Air Lock: ø 0 Ft.Hook Height Doors: Ø [W/H][ft] High Bay: 0 [W/D/H][ft] 0 Ton 0 Ft. Hook Height Standard Connerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleantiness: **e**K Temperature: E.C.S: Humidity: 0 +/-0 +/-0 F Power Cutoff: NA Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commerical Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Special Hoisting Equip: NA Work Stands: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No

NA: Not Applicable TD: To Be Determined

or 3: Area Clear

or 4: Facility Clear

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DEPLOY OTV/SPACECRAFT
        Task No: 24
Subtask No: < 24.0300>
                                 Description: PAYLOAD VERIFICATION TEST
Hazard Level(*): 1 None
Activity: PERFORM SYSTEM VERIFICATION TESTING TO VERIFY OTV AND S/C ARE READY
FOR LAUNCH INTO GEO
Personnel:
                    Vehicle
                                                    Control Station
             Payload Specialist(s)
             Engineering
                                      0)
                                                            2
                                      ø)
             Shop
             Inspector
                                      e)
                                      9)
             Other
               Sub Total-
                                              1)-
                                                        Total.
                                               Total Manhours (
Serial Time To Complete: 240 min
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                 Physical Size:
                                                        Crane Capacity:
                                [W/D/H][ft]
[W/H][ft]
                          0
         Air Lock:
                     0
                              0
                                                 0 Ton
                                                            0 Ft. Hook Height
            Doors:
                      A
                          A
         High Bay:
                      0
                          0
                              0 [W/D/H][ft]
                                                 0 Ton
                                                             9 Ft.Hook Height
Standard Commerical Power: NA
                                   Instrumentation Power [Uninterrupted]: NA
Cleanliness:
                                   E.C.S:
                                           Humidity:
                                                            Temperature:
                                         0 +/- 0 %
                                                                  0 +/-
                                                                          0 F
                                   Power Cutoff: NA
Closed Circuit Television: NA
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: NA
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): N
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: NA
                                   Potable Water: NA
                                                            Paging: NA
Commercial Telephone: NA
                                   RF System(*): C
                                                            OIS: NA
Personnel Airlock: NA
                                   Grounding: NA
                                                            Explosion Proof: NA
                  Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                   OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                   Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                   Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Conister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                      or C: both
                                                         or C: both
                      or N: none
                                                         or N: none
         Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

DEPLOY OTV/SPACECRAFT Tosk No: 24 Description: <REMOVE PAYLOAD FROM CARGO BAY > Subtask No: < 24.0400> Hazard Level(*): 1 None Activity: PREPARE FOR OTV/SC AEROBRAKE INSTALLATION Personnel: Control Station Vehicle Payload Specialist(s) Engineering 0) 2)2)2 Shop 0) 0 Inspector Other Sub Total-2)-Total-16.0) Serial Time To Complete: 120 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: 0 0 0 [W/D/H][ft] 0 Ton 0 Ft. Hook Height [W/H][ft] Doors: A A [W/D/H][ft] High Bay: 0 Ton 0 Ft.Hook Height Standard Connerical Power: NA Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: **ØK** Temperature: 0 +/-0 % 0 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commerical Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: Ku Band or B: deluge or C: both or C: both or N: none or N: none

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Others:= Y: Yes

N: No

NA: Not Applicable

TD: To Be Determined

Hazard Level:= 1: None

or 2: Local Clear

or 4: Facility Clear

or 3: Area Clear

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Task No: 24
                            DEPLOY OTV/SPACECRAFT
                                 Description: <ELEC, MECH FLUID DISCONNECT
Subtask No: < 24.0500>
Hozord Level(*): 1 None
Activity: REMOVE ALL ELECTRICAL, MECHANICAL AND FLUID INTERFACES BETWEEN THE
ORBITER AND THE OTV.
Personnel:
                                                      Control Station
                     Vehicle
             Payload Specialist(s)
                                                              Ø)
                                                              2) 2) 2)
              Engineering
                                       Ø)
              Shop
                                       0)
              Inspector
                                       ø
                                       ě
              Other
                Sub Total-
                                               1)
                                                          Total.
Serial Time To Complete:
                                                  Total Manhours (
                                                                     7.0)
                             60 min
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                                                         Crane Capacity:
                  Physical Size:
                              0 [W/D/H][ft]
[W/H][ft]
                         A
                                                   0 Ton
         Air Lock:
                                                              6 Ft. Hook Height
                      0
             Doors:
                          0
         High Bay:
                      0
                          0
                               0
                                 [W/D/H][ft]
                                                   0 Ton
                                                              Ø Ft.Hook Height
Standard Commerical Power: NA
                                    Instrumentation Power [Uninterrupted]: NA
Cleanliness:
                                    E.C.S: Humidity:
                9K
                                                             Temperature:
                                          0 +/-
                                                                    0 +/-
Closed Circuit Television: NA
                                    Power Cutoff: NA
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: NA
                                    Helium Supply: NA
                                                             Shop Air: NA
Fire Protection/Deluge(+): N
                                    Shower/Eye Wash: NA
                                                             Vacuum: NA
Lightning Protection: NA
                                    Potable Water: NA
                                                             Paging: NA
Commercial Telephone: NA
                                    RF System(*): C
                                                             OIS: NA
Personnel Airlock: NA
                                    Grounding: NA
                                                             Explosion Proof: NA
                   Detailed Equipment Resources
Special Tool Kit: NA
                                                     OTV Adapter: NA
                              Slings: NA
Breakout Boxes: NA
                              Adapter Cables: NA
                                                     Ground Power Unit: NA
Air Pallet: NA
                              Work Stands: NA
                                                     Special Hoisting Equip: NA
NASA Canister: NA
                              OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                  RF System= A: S Band & C Band
                      or B: deluge
                                                          or B: Ku Band
                       or C: both
                                                          or C: both
                       or N: none
                                                          or N: none
          Hazard Level:= 1: None
                                                    Others:= Y: Yes
                      or 2: Local Clear
                                                             N: No
                       or 3: Area Clear
                                                            NA: Not Applicable
                                                             TD: To Be Determined
                       or 4: Facility Clear
```

```
Task No: 24
                           DEPLOY OTV/SPACECRAFT
Subtask No: < 24.0600>
                                 Description: <INSTALL/DEPLOY AREOBRAKE
Hazard Level(*): 1 None
Activity: INSTALL/DEPLOY AEROBRAKE SYSTEM IN LEG IF REQUIRED
Personnel:
                                                    Control Station
                    Vehicle
             Payload Specialist(s)
                                      3)
                                      e۶
                                                            e'
             Engineering
                                      θŚ
                                                            0
             Shop
             Inspector
                                      Ð)
                                                            ø)
                                    8
             Other
               Sub Total-
                                              3).
                                                        Total-
Serial Time To Complete: 120 min
                                                Total Manhours (
                                                                   6.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                       Crane Capacity:
                                [W/D/H][ft]
         Air Lock:
                     Ø
                          ø
                                                 0 Ton
                                                            6 Ft. Hook Height
                              0
                                 W/H][f
            Doors:
                      0
                          A
                              0 [W/D/H][ft]
         High Boy:
                                                 0 Ton
                                                            9 Ft.Hook Height
Standard Commerical Power: NA
                                   Instrumentation Power [Uninterrupted]: NA
                                   E.C.S: Humidity:
Cleanliness:
                                                           Temperature:
                                         0 +/- 0 %
                                                                 0 +/-
                                   Power Cutoff: NA
                                                           Facility GN2: NA
Closed Circuit Television: NA
Fuel/Oxidizer Disposal: NA
                                   Helium Supply: NA
                                                           Shop Air: NA
Fire Protection/Deluge(*): N
                                   Shower/Eye Wash: NA
                                                           Vacuum: NA
Lightning Protection: NA
                                   Potable Water: NA
                                                           Paging: NA
Commercial Telephone: NA
                                   RF System(*): C
                                                           OIS: NA
Personnel Airlock: NA
                                   Grounding: NA
                                                           Explosion Proof: NA
                  Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                   OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                   Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                   Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                RF System= A: S Band & C Band
                      or B: deluge
                                                        or B: Ku Band
                      or C: both
                                                        or C: both
                      or N: none
                                                        or N: none
         Hazard Level:= 1: None
                                                  Others:= Y: Yes
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                          NA: Not Applicable
                                                          TD: To Be Determined
                      or 4: Facility Clear
```

```
Task No: 24
                           DEPLOY OTV/SPACECRAFT
Subtask No: < 24.0700>
                                Description: <PERFORM POCC LAUNCH TESTS
Hazard Level(+): 1 None
Activity: ISSUE COMMAND AND VERIFY OTV AND S/C READY FOR LAUNCH TO GEO
Personnel:
                    Vehicle
                                                    Control Station
             Payload Specialist(s)
                                      1)
                                                            2)
             Engineering
                                      0
             Shop
                                      0)
             Inspector
                                      0
                                      ø)
             Other
               Sub Total-
                                              1)-
                                                         Total-
Serial Time To Complete:
                            60 min
                                                Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                       Crane Capacity:
                                [W/D/H][ft]
[W/H][ft]
         Air Lock:
                     0
                          0
                                                 0 Ton
                                                             0 Ft.Hook Height
                              0
            Doors:
                          A
         High Bay:
                              0 [W/D/H][ft]
                                                 0 Ton
                                                             6 Ft.Hook Height
Standard Commerical Power: NA
                                   Instrumentation Power [Uninterrupted]: NA
Cleanliness:
                                   E.C.S: Humidity:
               ak
                                                            Temperature:
                                         0 +/-
                                                0 %
                                                                  0 +/-
                                                                          0 F
                                   Power Cutoff: NA
Closed Circuit Television: NA
                                                            Facility GN2: NA
Fuel/Oxidizer Disposal: NA
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): N
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: NA
                                   Potable Water: NA
                                                            Paging: NA
Commercial Telephone: NA
                                   RF System(*): C
                                                            OIS: NA
Personnel Airlock: NA
                                   Grounding: NA
                                                            Explosion Proof: NA
                  Detailed Equipment Resources
Special Tool Kit: NA
                                                   OTV Adapter: NA
                             Slings: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Conister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                RF System= A: S Band & C Band
                      or B: deluge
                                                         or B: Ku Band
                                                         or C: both
                      or C: both
                      or N: none
                                                         or N: none
                                                   Others:= Y: Yes
         Hazard Level:= 1: None
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

DEPLOY OTV/SPACECRAFT Task No: 24 Subtask No: < 24.0800> Description: <DEPLOY OTV S/C FROM ORBITER Hazard Level(*): 1 None Activity: DEPLOY COMBINATION OTV AND SPACECRAFT IN LEO-MOVE THE ORBITER TO A SAFE DISTANCE FROM THE OTV Personnel: **Control Station** Vehicle Payload Specialist(s) 0) 2) 2) 2) Engineering O) 0) Shop 9) Inspector (e) Other Sub Total-1)-Total-Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] Air Lock: 0 0 Ton 0 Ft. Hook Height Doors: ø A W/H][ft] **High Bay:** 0 0 0 [W/D/H][ft] 0 Ton 6 Ft. Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: **ø**K E.C.S: Humidity: Temperature: 0 F 0 +/- 0 % 0 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commerical Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No NA: Not Applicable or 3: Area Clear

TD: To Be Determined

Tosk No: 25 LAUNCH FROM LEO Description: <VERIFY NAV POSITION Subtask No: < 25.0100> Hazard Level(*): 1 None Activity: VERIFY POCC NAV UPDATE IS RECEIVED AND NAV COMPUTER HAS UPDATED INFORMATION Personnel: Control Station Vehicle Payload Specialist(s) 2 0) Engineering 2 0) Shop Inspector 0 ø) Other Sub Total-0) Total-Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] Air Lock: Ø 0 Ton 0 Ft.Hook Height 0 0 [W/H][[t] Doors: High Bay: 0 0 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: øK E.C.S: Humidity: Temperature: 0 +/- 0 % 0 +/-0 F Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear or 3: Area Clear N: No NA: Not Applicable

TD: To Be Determined

LAUNCH FROM LEO Task No: 25 Subtask No: < 25.0200> Hazard Level(+): 1 None Description: <VERIFY PROPULSION SYSTEM Activity: VERIFY TANK PRESSURES ARE NORMAL-VERIFY ENGINES CONTROL Personnel: Vehicle **Control Station** Payload Specialist(s) 0) 0) 2) Engineering 0) Shop øŚ ø\$ Inspector (e) Other 0)-Sub Total-Total-Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 [W/D/H][ft] Air Lock: 0 0 Ton 0 Ft.Hook Height Doors: a a [W/H][ft] High Bay: 0 0 0 [W/D/H][ft] 0 Ton 6 Ft. Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: E.C.S: Humidity: Temperature: 0 F 0 +/- 0 % 0 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Grounding: NA Personnel Airlock: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes

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N: No

NA: Not Applicable

TD: To Be Determined

or 2: Local Clear

or 3: Area Clear

LAUNCH FROM LEO Task No: 25 Description: <LAUNCH TO GEO Subtask No: < 25.0300> Hazard Level(+): 1 None Activity: ISSUE COMMAND VIA POCC TO LAUNCH TO GEO Personnel: Control Station Vehicle Payload Specialist(s) Engineering 0) 2 2) 2) 0) Shop Inspector Ø) (0) (0) Other Sub Total-0). Total Serial Time To Complete: 240 min Total Manhours (24.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] [W/H][ft] Air Lock: 0 0 Ton 0 Ft.Hook Height Ø Doors: a 0 [W/D/H][ft] High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: ØK E.C.S: Humidity: Temperature: 0 +/- 0 % 0 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

Task No: 26

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PERFORM MISSION

Subtask No: < 26.0100> Hazard Level(+): 1 None Description: OEPLOY SPACECRAFT Activity: ISSUÉ COMMAND TO RELEASE THE SPACECRAFT IN GEO Personnel: Vehicle Control Station Payload Specialist(s) Ø) 0) 2) 2) 2) Engineering 0) e { e } Shop Inspector Other Ø) 0)-Sub Total-Total-Serial Time To Complete: 60 min Total Manhours (6.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] 0 0 0 Ton 0 Ft.Hook Height Air Lock: Doors: a 0 0 [W/D/H][ft] High Boy: 0 0 0 Ton **6** Ft. Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: E.C.S: Humidity: OK Temperature: 0 % 0 +/-0 +/-0 F Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commerical Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

ORIENT AND RTN FROM GEO TO LEO Task No: 27 Description: <ISSUE NAV UPDATE Subtask No: < 27.0100> Hazard Level(*): 1 None Activity: POCC ISSUE NAV UPDATE-VERIFY COMPUTER RESPOND TO NEW NAV UPDATE Personnel: Control Station Vehicle Payload Specialist(s) Ø) 2) 2) 2) Engineering 0) 0) Shop 0) Inspector (0) (0) Other 0)-Sub Total-Total Serial Time To Complete: 60 min Total Manhours (6.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 Ton 0 Ft.Hook Height Doors: 0 0 [W/D/H][ft] High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: ØK E.C.S: Humidity: Temperature: 0 +/- 0 % 0 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Potable Water: NA Lightning Protection: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

ORIENT AND RTN FROM GEO TO LEO

Task No: 27

.

Description: <POSITION OTV TO DE-ORBIT Subtask No: < 27.0200> Hazard Level(*): 1 None Activity: USING RCS, POSITION OTV FOR RETURN TO LEO Personnel: Control Station Vehicle Payload Specialist(s) 0) 0) Engineering 0) 2 2 e) Shop Inspector Other e١ Sub Total-0)-Total-Serial Time To Complete: Total Manhours (60 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: Air Lock: 0 [W/D/H][ft] 0 Ton ø Ø 0 Ft.Hook Height [W/H][ft] Doors: 0 [W/D/H][ft] High Bay: 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: E.C.S: Humidity: AX Temperature: 0 +/- 0 % 0 +/-0 F Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Personnei Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable TD: To Be Determined or 4: Facility Clear

```
ORIENT AND RTN FROM GEO TO LEO
        Task No: 27
                                 Description: <FIRE ENGINES
Subtask No: < 27.0300>
Hazard Level(+): 1 None
Activity: VERIFY ENGINE FIRE UNDER COMPUTER CONTROL PER FLIGHT PROCEDURES
Personnel:
                                                    Control Station
                    Vehicle
             Payload Specialist(s)
                                      O)
                                                            2 2 2
             Engineering
                                      Θĺ
                                      ēί
             Shop
                                      0)
             Inspector
                                      ΘŚ
             Other
               Sub Total-
                                           ·( Ø)·
                                                         Total-
Serial Time To Complete:
                            60 min
                                                Total Manhours (
Automation Need: (Primary Key)
Automation Secondary Key(s)
                   Detailed Facility Resources
                 Physical Size:
                                                        Crane Capacity:
         Air Lock:
                          A
                              0 [W/D/H][ft]
                                                  0 Ton
                                                             6 Ft. Hook Height
                      0
                                 [W/H][f
            Doors:
                      Ø
                          0
                              0 [W/D/H][ft]
         High Bay:
                      Ø
                                                  0 Ton
                                                             0 Ft. Hook Height
Standard Commerical Power: NA
                                   Instrumentation Power [Uninterrupted]: NA
Cleanliness:
                                   E.C.S: Humidity:
                                                            Temperature:
                                         0 +/- 0 %
                                                                  0 +/-
                                   Power Cutoff: NA
                                                            Facility GN2: NA
Closed Circuit Television: NA
Fuel/Oxidizer Disposal: NA
                                   Helium Supply: NA
                                                            Shop Air: NA
Fire Protection/Deluge(*): N
                                   Shower/Eye Wash: NA
                                                            Vacuum: NA
Lightning Protection: NA
                                   Potable Water: NA
                                                            Paging: NA
Commerical Telephone: NA
                                   RF System(*): C
                                                            OIS: NA
Personnel Airlock: NA
                                   Grounding: NA
                                                            Explosion Proof: NA.
                   Detailed Equipment Resources
Special Tool Kit: NA
                             Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: NA
                             Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                             OTV Canister: NA
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
or C: both
                                                         or B: Ku Band
                                                         or C: both
                      or N: none
                                                         or N: none
                                                   Others:= Y: Yes
         Hazard Level:= 1: None
                      or 2: Local Clear
                                                           N: No
                      or 3: Area Clear
                                                           NA: Not Applicable
                      or 4: Facility Clear
                                                           TD: To Be Determined
```

ORIENT AND RTN FROM GEO TO LEO Task No: 27 Subtask No: < 27.0400> Description: <ORBIT IN LEO Hazard Level(*): 1 None Activity: INSERT OTV INTO LEO UNDER COMPUTER CONTROL Personnel: Control Station Vehicle Payload Specialist(s) 9) Engineering 0) Shop 0) Inspector Other 0) Sub Total-0)-Total-Serial Time To Complete: 240 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 Ton 0 [W/D/H][ft] Air Lock: **0** Ft. Hook Height 0 0 Doors: θ 0 W/H][ft High Boy: 0 0 [W/D/H][ft] 0 Ton 9 Ft. Hook Height Standard Connerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: 8K E.C.S: Humidity: Temperature: 0 +/-0 +/- 0 X Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No NA: Not Applicable TD: To Be Determined or 3: Area Clear

ORBITER AND OTV RENDEZVOUS

Task No: 28

Subtask No: < 28.0100> Description: <POSTION OTV IN STANDOFF ORBIT > Hazard Level(*): 1 None Activity: TRANSFER OTV TO RENDEZVOUS ZONE. POSITION ORBITER IN STANDOFF POSITION. Personnel: **Control Station** Vehicle Payload Specialist(s) 0) 2) 0) Engineering 0) Shop 0) Inspector Other Sub Total-0)-Total-Serial Time To Complete: 240 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] [W/H][ft] 0 0 Ton Air Lock: 0 0 Ft.Hook Height Doors: 0 0 0 [W/D/H][ft] High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: Temperature: 0 +/- 0 X 0 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA OTV Conister: NA NASA Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: Ku Band or B: deluge or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

OTV RECOVERY Task No: 29 Subtask No: < 29.0100> Description: <RETRACT EEC, VERIFY OTV SAFE > Hazard Level(*): 1 None Activity: ISSUE COMMANDS FROM ORBITER OR OTVCC TO RETRACT THE EEC. SHUTDOWN /SAFE OTV FOR LOADING Personnel: **Control Station** Vehicle Payload Specialist(s) 0) 0) 2) 2) 2) Engineering 0) Shop 0) O) Inspector 0) Other Sub Total-0)-6) Total-Serial Time To Complete: 120 min 12.0) Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] 0 0 Ton Air Lock: Ø 0 0 Ft.Hook Height Doors: 0 0 High Bay: 0 0 0 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: Temperature: 0 +/-0 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commerical Telephone: NA OIS: NA RF System(*): C Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA OTV Adapter: NA Slings: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No NA: Not Applicable or 3: Area Clear or 4: Facility Clear TD: To Be Determined

Task No: 29 OTV RECOVERY Subtask No: < 29.0200> Description: <VENT OTV CRYO SYSTEM Hazard Level(*): 1 None Activity: CONNECT ELECTRICAL, MECHANICAL, AND FLUID SYSTEMS TO VENT THE OTV CRYO SYSTEM Personnel: **Control Station** Vehicle Payload Specialist(s) Engineering 0) 0 0) 0 Shop Inspector 0) Ð (e) Other Sub Total-2) Total-Serial Time To Complete: 240 min Total Manhours (8.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: 0 0 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Doors: a W/H][f High Bay: 0 [W/D/H][ft] 0 Ton 0 Ft.Hook Height? Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: E.C.S: Humidity: OK Temperature: 0 +/-0 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commerical Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA **Breakout Boxes: NA** Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band. Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable TD: To Be Determined or 4: Facility Clear

OTV RECOVERY

Task No: 29

Subtask No: < 29.0300> Hazard Level(+): 1 None Description: <OTV CAPTURE Activity: USING THE ORBITER GRAPPLE FIXTURE CAPTURE THE OTV AND COMPONENTS Personnel: Vehicle **Control Station** Payload Specialist(s) 2) Ø) Engineering 0) e 0 Shop e) Inspector Other 8) Sub Total-2) Total-Serial Time To Complete: 60 min Total Manhours (2.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 0 Ton **6** Ft. Hook Height Doors: A ø [W/D/H][ft] High Boy: 0 0 0 0 Ton 9 Ft. Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: E.C.S: Humidity: Temperature: 0 +/-0 % 0 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commerical Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge- A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

OTV RECOVERY Task No: 29 Subtask No: < 29.0400> Hazard Level(*): 1 None Description: <REMOVE AND STORE THE AEROBRAKE> Activity: USING THE SPECIAL TOOL KIT, PERFORM THE EVA TO REMOVE AND STORE THE AERO BRÁKE. Personnel: Control Station Vehicle Payload Specialist(s) (O) Engineering 0) 0) e) Shop 0 0 Inspector (ē) Other Sub Total-3). Total-Serial Time To Complete: 180 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] Air Lock: 0 0 Ton 0 **6 Ft.Hook Height** A 0 Doors: [W/H][fi 0 [W/D/H][ft] High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: E.C.S: Humidity: Temperature: 0 +/- 0 % 0 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commerical Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 29 OTV RECOVERY Description: <LOAD OTV IN THE ORBITER BAY Subtask No: < 29.6500> Hazard Level(+): 1 None Activity: LOAD AND SECURE THE OTV INTO THE ORBITER PAYLOAD BAY. CLOSE ORBITER PAYLOAD BAY DOORS. Personnel: **Control Station Vehicle** Paytoad Specialist(s) 9) Engineering e } 0 Shop Inspector 0 #Other ē) Sub Total-3)-Total-Serial Time To Complete: 120 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] 0 Ton Air Lock: 0 0 Ft. Hook Height Ð [w/H][ft] [w/D/H][ft] Doors: High Bay: 0 Ton 0 Ft.Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: E.C.S: Humidity: Temperature: 0 +/-0 +/-0 F Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(+): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others: Y: Yes or 2: Local Clear

or 3: Area Clear

or 4: Facility Clear

N: No

NA: Not Applicable

TD: To Be Determined

OTV RECOVERY Task No: 29 Subtask No: < 29.0600> Hazard Level(*): 1 None Description: <PREPARE OTV FOR DEORBIT Activity: SECURE OTV FOR DEORBIT Personnel: **Control Station** Vehicle Payload Specialist(s) ē (Engineering Shop Inspector 0 \ e\ Other Sub Total-2) Total. Serial Time To Complete: 180 min Total Manhours (8.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 [W/D/H][ft] 0 Ton Air Lock: 0 0 Ft.Hook Height Doors: A High Bay: 0 [W/D/H][ft] 0 Ton **6** Ft. Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: Temperature: 0 +/- 0 % 0 +/-0 F Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): C OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or C: both or B: Ku Band or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

RETURN TO LAUNCH SITE

Description: <DE-ORBIT

Task No: 38

Subtask No: < 30.0100> Hazard Level(+): 1 None Activity: RE-ENTER EARTH'S ATMOSPHERE Personnel: Vehicle Control Station Payload Specialist(s) (O) 0 0 e) Engineering Shop 0) 0 e { Inspector 9) * Other Sub Total-0). Total-Serial Time To Complete: 0 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(*) **Detailed Facility Resources** Crane Capacity: Physical Size: [W/D/H][ft] [W/H][ft] Air Lock: 0 Ø 0 0 Ton 0 Ft.Hook Height Doors: 0 [W/D/H][ft] High Bay: 0 Ø 0 Ft.Hook Height 0 Ton Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Clednliness: Temperature: 0 +/- 0 % 0 +/-Power Cutoff: NA Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): N OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA OTV Adapter: NA Slings: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

RETURN TO LAUNCH SITE Task No: 30 Description: <LAND AT KSC Subtask No: < 30.0200> Hazard Level (*): 1 None Activity: LAND SHUTTLE AT KSC SHUTTLE LANDING FACILITY Personnel: Control Station Vehicle Payload Specialist(s) Ø) 0) Engineering 0 Ð) 0) Shop 0) Inspector e) Other 0)-Sub Total-Ø) Total ø) Serial Time To Complete: 0 min Total Manhours (0.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 Ton 9 Ft. Hook Height Doors: A High Bay: 0 0 0 [W/D/H][ft]. 0 Ton **6** Ft. Hook Height Standard Commerical Power: NA Instrumentation Power [Uninterrupted]: NA Cleanliness: E.C.S: Humidity: ØK Temperature: 0 +/-0 % 0 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: NA Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): N Shower/Eye Wash: NA Vacuum: NA Lightning Protection: NA Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): N OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

REMOVE OTV FROM ORBITER Task No: 31 Description: MOVE ORBITER TO OPF Subtask No: < 31.0100> Hazard Level(+): 1 None Activity: MOVE ORBITER TO OPF FOR REMOVAL OF OTV AND OR COMPONENTS Personnel: Control Station Vehicle Payload Specialist(s) Ø) e) Engineering 0) Ø) Shop ě٥ Inspector 0 e١ Other Sub Total-0) Ø) Total Serial Time To Complete: 120 min Total Manhours (0.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] [W/H][ft] 0 0 Ton 0 Ft. Hook Height Air Lock: 8 Doors: 0 θ High Boy: [W/D/H][ft] 0 0 0 0 Ton @ Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: NA Commercial Telephone: NA RF System(*): N OIS: NA Personnel Airlock: NA Grounding: NA Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: NA OTV Adapter: NA Slings: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Conister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

REMOVE OTV FROM ORBITER Task No: 31 Description: <REMOVE OTV Subtask No: < 31.0200> > Hazard Level(*): 2 Local Clear Activity: LOWER STRONGBACK INTO POSITION-REMOVE HOLDDOWN HARDWARE-ATTACH OTV TO STRONGBACK-LIFT OTV FROM THE ORBITER PAYLOAD BAY Personnel: **Control Station** Vehicle Payload Specialist(s) (A) Engineering 2) 0) 0 Shop ø Inspector Other Sub Total-8) Total-Serial Time To Complete: 180 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: [W/D/H][ft] [W/H][ft] 0 Ton 0 Ft.Hook Height Air Lock: Doors: 0 [W/D/H][ft] High Bay: 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % Power Cutoff: NA 70 +/-Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Vacuum: NA Shower/Eye Wash: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): C OIS: NA Personnel Airlock: Y Grounding: Y **Explosion Proof: Y Detailed Equipment Resources** Special Tool Kit: Y Slings: Y OTV Adapter: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Canister: NA OTV Conister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

REMOVE OTV FROM ORBITER Task No: 31 Description: <INSTALL OTV IN TRANSPORTER Subtask No: < 31.0300> Hazard Level(*): 2 Local Clear Activity: PLACE OTV INTO CANISTER AND SECURE FOR TRANSPORT Personnel: Control Station Vehicle Payload Specialist(s) (0) Ø) Engineering 1) e) 5) 2) 0) Shop 0) Inspector *** Other Sub Total-8)-Total-Serial Time To Complete: 120 min Total Manhours (16.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] 0 0 Ton 6 Ft. Hook Height Air Lock: 0 Doors: ø 0 [W/D/H][ft] High Bay: 0 0 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/-70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(+): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: Y Slings: Y OTV Adapter: Y Breakout Boxes: NA Ground Power Unit: NA Adapter Cables: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: NA NASA Conister: NA OTV Conister: Y (*) Legend For Data Input Fire Protection/Deluge A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear or 3: Area Clear N: No NA: Not Applicable or 4: Facility Clear TD: To Be Determined

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MOVE TO PROCESSING FACILITY
        Task No: 34
Subtask No: < 34.0100>
                                 Description: <MOVE OTV TO OTVPF
Hazard Level(*): 1 None
Activity: TRANSPORT THE OTV TO THE OTV PROCESSING FACILITY
Personnel:
                                                     Control Station
                     Vehicle
             Payload Specialist(s)
                                                             O)
                                                             0
             Engineering
                                      3)
                                                             O)
             Shop
                                                             0
             Inspector
                                      1)
             Other
                                     ( 0)
               Sub Total-
                                              5).
                                                         Total-
Serial Time To Complete: 120 min
                                                 Total Manhours (
                                                                    10.0)
Automation Need: (Primary Key)
Automation Secondary Key(s)
                    Detailed Facility Resources
                  Physical Size:
                                                        Crane Capacity:
                              0 [W/D/H][ft]
[W/H][ft]
                         0
                                                  0 Ton
         Air Lock:
                                                              0 Ft.Hook Height
                      0
            Doors:
                          0
         High Bay:
                          0
                              0 [W/D/H][ft]
                                                  0 Ton
                                                              0 Ft.Hook Height
Standard Commerical Power: Y
                                    Instrumentation Power [Uninterrupted]: NA
Cleanliness: 100K
                                    E.C.S: Humidity:
                                                             Temperature:
                                         50 +/- 5 %
                                                                  70 +/-
Closed Circuit Television: NA
                                    Power Cutoff: NA
                                                             Facility GN2: NA
Fuel/Oxidizer Disposal: Y
                                    Helium Supply: NA
                                                             Shop Air: NA
Fire Protection/Deluge(*): A
                                    Shower/Eye Wash: Y
                                                             Vacuum: NA
Lightning Protection: Y
                                    Potable Water: Y
                                                             Paging: Y
Commerical Telephone: Y
                                    RF System(*): N
                                                             OIS: NA
Personnel Airlock: Y
                                    Grounding: Y
                                                             Explosion Proof: Y
                   Detailed Equipment Resources
Special Tool Kit: NA
                              Slings: NA
                                                    OTV Adapter: NA
Breakout Boxes: NA
                              Adapter Cables: NA
                                                    Ground Power Unit: NA
Air Pallet: NA
                             Work Stands: NA
                                                    Special Hoisting Equip: NA
NASA Canister: NA
                              OTV Canister: Y
                  (*) Legend For Data Input
Fire Protection/Deluge= A: fire protection
                                                 RF System= A: S Band & C Band
                      or B: deluge
                                                          or B: Ku Band
                      or C: both
                                                          or C: both
                      or N: none
                                                          or N: none
          Hazard Level:= 1: None
                                                   Others:= Y: Yes
                      or 2: Local Clear
                                                            N: No
                      or 3: Area Clear
                                                            NA: Not Applicable
                      or 4: Facility Clear
                                                            TD: To Be Determined
```

MOVE TO PROCESSING FACILITY Task No: Subtask No: < 34.0200> Description: <REMOVE OTV FROM TRANSPORTER Hazard Level(+): 2 Local Clear Activity: ATTACH O/H CRANE AND SLINGS. REMOVE HOLDDOWN HARDWARE. REMOVE OTV FROM THE TRANSPORTER Personnel: Vehicle Control Station Payload Specialist(s) (0) O) Engineering 0) 5) 2) Shop 0) ø) Inspector Other (e) Sub Total-8)-8) Total-Serial Time To Complete: 300 min Total Manhours (40.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: 40 40 50 [W/D/H][ft] 10 Ton 45 Ft. Hook Height [w/H][ft] A Doors: High Boy: Ø 0 [W/D/H][ft] 0 Ton 9 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-70 +/-Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: Y Vacuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personne! Airlock: Y Grounding: Y Explosion Proof: Y Detailed Equipment Resources Special Tool Kit: NA Slings: Y OTV Adapter: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: NA Special Hoisting Equip: Y NASA Conister: NA OTV Canister: Y (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No NA: Not Applicable or 3: Area Clear or 4: Facility Clear TD: To Be Determined

Task No: 34 MOVE TO PROCESSING FACILITY Subtask No: < 34.0300> Description: <INS Hazard Level(*): 2 Local Clear Activity: INSTALL/SECURE OTV IN THE OTV WORKSTAND Description: <INSTALL OTV IN WORKSTAND Personnel: Control Station Vehicle Payload Specialist(s) (0) Ø) 1) 0) Engineering 9) Shop Inspector ē١ Other Sub Total-8) Total-Serial Time To Complete: 240 min 32.0) Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(8) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 Ton 0 Ft. Hook Height Doors: 35 45 High Bay: 70 100 85 [W/D/H][ft] 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(+): A Shower/Eye Wash: Y Vacuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commerical Telephone: Y OIS: NA RF System(+): N Personnel Airlock: Y Grounding: Y **Explosion Proof: Y Detailed Equipment Resources** Special Tool Kit: Y Slings: Y OTV Adapter: Y Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: Y NASA Canister: NA OTV Conister: NA (*) Legend For Data Input Fire Protection/Deluge- A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 34 MOVE TO PROCESSING FACILITY Subtask No: < 34.0400> Description: <REMOVE BATTERIES AND ORDNANCE > Hazard Level(*): 2 Local Clear Activity: REMOVE BATTERY ACCESS PANELS AND REMOVE BATTERIES. REMOVE ALL UNUSED ORDNANCE Personnel: Control Station Vehicle Payload Specialist(s) 0) 0) Engineering 1) Shop O) Inspector Other ø) Sub Total-6) Total-Serial Time To Complete: 180 min 18.6) Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] Air Lock: 0 0 Ton 0 Ft.Hook Height Ø Doors: High Boy: 70 100 85 [W/D/H][ft] 0 Ft.Hook Height 0 Ton Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: Y Helium Supply: NA Shop Air: NA Fire Protection/Deluge(+): A Shower/Eye Wash: Y Vacuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA **Breakout Boxes: NA** Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input RF System A: S Band & C Band Fire Protection/Deluge A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

MOVE TO PROCESSING FACILITY Task No: 34 Subtask No: < 34.6500> Description: <PURGE AND LEAK CHECK OTV CRYO > Hazard Level(*): 3 Area Clear Activity: CONNECT OTV CRYO LOAD PURGE CART, PURGE OTV CRYO SYSTEM AND PERFORM LEAK CHECKS Personnel: . **Control Station** Vehicle Payload Specialist(s) Ø) Engineering 1)
2)
1) 0 Shop Ð. Inspector 0) Other Sub Total 4). Total-Serial Time To Complete: 180 min Total Manhours (12.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] 0 0 [W/H][ft] Air Lock: 0 Ton 9 Ft. Hook Height Doors: High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-5 F Closed Circuit Television: Y Power Cutoff: NA Facility GN2: Y Fuel/Oxidizer Disposal: Y Helium Supply: Y Shop Air: Y Fire Protection/Deluge(*): B Shower/Eye Wash: Y Vacuum: NA Lightning Protection: Y Potable Water: Y Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: Y **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

MOVE TO PROCESSING FACILITY Task No: 34 Description: <INSTALL OTV GPU/GSE Subtask No: < 34.6600> Hazard Level(+): 1 None Activity: CONNECT GROUND POWER UNIT AND INSTRUMENTATION GSE TO OTV Personnel: **Control Station** Vehicle Payload Specialist(s) -Engineering ΘÌ Shop Inspector Other 0 Sub Total-Total Serial Time To Complete: 120 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] 0 0 Ton 0 Ft. Hook Height Air Lock: Ð Doors: A A High Bay: 70 100 85 [W/D/H][ft] 0 Ton **8** Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/-5 % 70 +/-5 F Power Cutoff: NA Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(+): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Explosion Proof: NA Personnel Airlock: Y Grounding: Y Detailed Equipment Resources Special Tool Kit: Y Slings: NA OTV Adapter: NA Ground Power Unit: Y **Breakout Boxes: Y** Adapter Cables: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 35 CONDUCT PLANNED MAINTENANCE Subtask No: < 35.0100> Hazard Level(+): 2 Local Clear Description: <REFURBISH AEROBRAKE SYSTEM Activity: PERFORM MAINTENANCE AND REFURBISHMENT OF THE AEROBRAKE SYSTEM Personnel: Vehicle Control Station Payload Specialist(s) Ð) 6 2 Engineering ø) 0) Shop Inspector 8 Other Sub Total-(10)-10) Total-Serial Time To Complete: 600 min Total Manhours (100.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] 0 0 [W/H][ft] 0 Ton 0 Ft.Hook Height Air Lock: Doors: 70 100 85 [W/D/H][ft] High Bay: 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % 5 F 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Ground Power Unit: NA Breakout Boxes: NA Adapter Cables: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: Y NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

CONDUCT PLANNED MAINTENANCE Task No: 35 Subtask No: < 35.0200> Description: <REMOVE ENGINE PUMPS FOR REFURB> Hazard Level(*): 2 Local Clear Activity: REMOVE THE ENGINE/PUMPS USING THE SPECIAL TOOL KIT AND ROUTE TO SHOP FOR REPAIR AND REFURBISHMENT Personnel: **Control Station** Vehicle Payload Specialist(s) 2) 6) 2) 0) 0) Engineering Shop O) e) Inspector Other Sub Total-(10) Total-10) Serial Time To Complete: 360 min Total Manhours (60.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] [W/H][ft] @ Ton Air Lock: 0 0 Ø 0 Ft.Hook Height Doors: 0 0 High Bay: 70 100 85 [W/D/H][ft] 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-5 % 70 +/-5 F Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Groundina: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Ground Power Unit: NA Adapter Cables: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: Y NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge- A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable

TD: To Be Determined

Task No: 35 CONDUCT PLANNED MAINTENANCE Description: <REINSTALL ENGINE/PUMPS Subtask No: < 35.6300> Hazard Level(*): 2 Local Clear Activity: REINSTALL AND RETEST ENGINE/PUMPS Personnel: Vehicle **Control Station** Payload Specialist(s) Ø. 2) 0 Engineering Shop 2) Inspector Other Sub Total-(10) 105 Total. Serial Time To Complete: 360 min Total Manhours (60.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 Ton 0 Ft. Hook Height Doors: B High Bay: 70 100 85 [W/D/H][ft] 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: Y NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 35 CONDUCT PLANNED MAINTENANCE Description: <REINSTALL AEROBRAKE ASSEMBLY > Subtask No: < 35.0400> Hazard Level(*): 2 Local Clear Activity: REINSTALL AREOBRAKE ASSEMBLY USING SPECIAL TOOL KIT Personnel: **Control Station** Vehicle Payload Specialist(s) (0) 0 2) 6) 2) Engineering Shop 0 0) Inspector ΘŚ Other (10)-Sub Total-0) 10) Total-Serial Time To Complete: 240 min 40.Ó) Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 [W/D/H][ft] 0 Ton Air Lock: 0 0 0 Ft. Hook Height [W/H][ft] Doors: 0 High Bay: 70 100 85 [W/D/H][ft] 20 Ton 70 Ft. Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Power Cutoff: NA Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(+): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: Y Slings: NA OTV Adapter: NA **Breakout Boxes: NA** Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: Y NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge- A: fire protection RF System= A: S Band & C Band or B: Ku Band or B: deluge or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 36 CONDUCT UNPLANNED MAINTENANCE Subtask No: < 36.0100> Hazard Level(*): 1 None Description: <CONDUCT UNPLANNED MAINTENANCE > Activity: AS REQUIRED Personnel: **Control Station** Vehicle Payload Specialist(s) (0 • e) Engineering Shop e) 0 0 Inspector ēŚ Other Sub Total-0) Total-Serial Time To Complete: 0.0) 0 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: Air Lock: 0 0 0 (W/D/H][ft]
Doors: 0 0 (W/H][ft]
High Bay: 70 100 85 (W/D/H][ft] 0 Ton 0 Ft.Hook Height 9 Ft.Hook Height 0 Ton Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Facility GN2: NA Closed Circuit Television: NA Power Cutoff: NA Fuel/Oxidizer Disposal: N Helium Supply: N Shop Air: N Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: Ku Band or B: deluge or C: both. or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 37 INSTALL MODIFICATIONS Subtask No: < 37.6100> Hazard Level(*): 1 None Description: <INSTALL MODIFICATIONS Activity: AS REQUIRED Personnel: Vehicle **Control Station** Payload Specialist(s) O) Engineering Shop 0) Θĵ Inspector Other 0) Sub Total-0) Total-Serial Time To Complete: e min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: 0 0 0 [W/D/H][ft] Air Lock: 0 Ton @ Ft.Hook Height ø ø [W/H][ft] Doors: High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleantiness: 100X E.C.S: Humidity: Temperature: 50 +/-5 X 70 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Shop Air: N Helium Supply: N Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: Y Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Conister: NA OTV Conister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System A: S Band & C Band or B: Ku Band or B: deluge or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 38 RETEST VERIFICATION Description: <APPLY POWER TO OTV Subtask No: < 38.0100> Hazard Level (+): 1 None Activity: APPLY POWER TO OTV USING TEST SET OR OTVCS-VERIFY POWER PROFILE TO INSURE MOD PACKAGE POWER REQUIREMENTS Personnel: **Control Station** Vehicle Payload Specialist(s) O) 2) Engineering 2) Shop Inspector Other Sub Total-4) Total-Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: [W/D/H][ft] Ø 0 Ton **0** Ft.Hook Height 0 Doors: ø High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y Cleantiness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Power Cutoff: Y Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): A OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA **Breakout Boxes: Y** Adapter Cables: Y Ground Power Unit: Y Air Paliet: NA Work Stands: Y Special Hoisting Equip: NA OTV Canister: NA NASA Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No NA: Not Applicable or 3: Area Clear or 4: Facility Clear TD: To Be Determined

Task No: 38

RETEST VERIFICATION

Description: <PERFORM OTV HEALTH CHECKS Subtask No: < 38.0200> Hazard Level(*): 1 None Activity: PERFORM OTV RETEST/REVERIFICATION TO VERIFY HEALTH AND STATUS OF OTV Personnel: Control Station Vehicle Payload Specialist(s) 0 2) 2) 2) 2) Engineering 2) 1) Shop Inspector Other es s Sub Total-4). Total-Serial Time To Complete: 60 min Total Manhours (10.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] 0 Ton 8 8 Air Lock: 0 0 Ft.Hook Height 9 [W/H][ft Doors: High Bay: 70 100 85 [W/D/H][ft] 0 Ton 9 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: Cleanliness: 100K Temperature: 50 +/- 5 % 70 +/-Power Cutoff: Y Facility GN2: NA Closed Circuit Television: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(+): A OIS: Y Personnei Airlock: Y Grounding: Y Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: Y Adapter Cables: Y Ground Power Unit: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

Task No: 38 RETEST VERIFICATION Subtask No: < **38.6300**> Description: <REMOVE POWER FROM OTV Hazard Level(*): 2 Local Clear Activity: USING THE TEST SET OR THE OTVCS, REMOVE OTV POWER. REMOVE POWER FROM THE OTV CPU. Personnel: **Control Station** Vehicle Payload Specialist(s) a) Ð, 2) Engineering 2 Shop Inspector Other Ð) Sub Total-4). 105 Total-Serial Time To Complete: 60 min Total Manhours (10.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 [W/D/H][ft] [W/H][ft] Air Lock: 0 0 0 Ton 0 Ft.Hook Height Doors: 0 70 100 85 [W/D/H][ft] High Bay: 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: Y E.C.S: Humidity: 50 +/- 5 % Cleanliness: 100K Temperature: 70 +/-Closed Circuit Television: NA Power Cutoff: Y Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): A OIS: Y Personnel Airlock: Y Grounding: Y Explosion Proof: NA Detailed Equipment Resources Special Tool Kit: NA Slings: NA OTV Adapter: NA **Breakout Boxes: Y** Adapter Cables: Y Ground Power Unit: Y Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear or 3: Area Clear N: No NA: Not Applicable

TD: To Be Determined

or 4: Facility Clear

Task No: 39

OTV STORAGE AND RETURN TO FLOW

Description: <COVER OTV Subtask No: < 39.0100> Hazard Level(+): 1 None Activity: PLACE PROTECTIVE COVERS ON OTV Personnel: **Control Station** Vehicle Payload Specialist(s) (0) 0) 0 Engineering 1) Shop 4) 0 2 Inspector 0 ē Other Sub Total-7). Total-7.6) Serial Time To Complete: 60 min Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Crane Capacity: Physical Size: [W/D/H][ft] [W/H][ft] Air Lock: 0 0 Ø Ø Ton 6 Ft. Hook Height Doors: 0 70 100 85 [W/D/H][ft] High Bay: 0 Ft.Hook Height Ø Ton Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Explosion Proof: NA Grounding: Y Detailed Equipment Resources Special Tool Kit: NA OTV Adapter: NA Slings: NA Breakout Boxes: NA Ground Power Unit: NA Adapter Cables: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Conister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

OTV STORAGE AND RETURN TO FLOW Task No: 39 Subtask No: < 39.0200> Description: <SEAL OTV > Hazard Level (+): 1 None Activity: INSTALL SEALS OTV AND MONITOR FOR PROPER TEMP AND HUMIDITY. Personnel: Control Station Vehicle Payload Specialist(s) 0) Engineering ø) 1) 6) 2) 0) Shop e) 0) Inspector Other Sub Total-9)-Total-Serial Time To Complete: 60 min Total Manhours (9.0) Automation Need: (Primary Key) Automation Secondary Key(s) Detailed Facility Resources Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] 0 0 [W/H][ft] 70 100 85 [W/D/H][ft] Air Lock: 0 Ton 0 Ft.Hook Height Doors: High Bay: 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Shop Air: NA Helium Supply: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adopter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or C: both or B: Ku Band or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

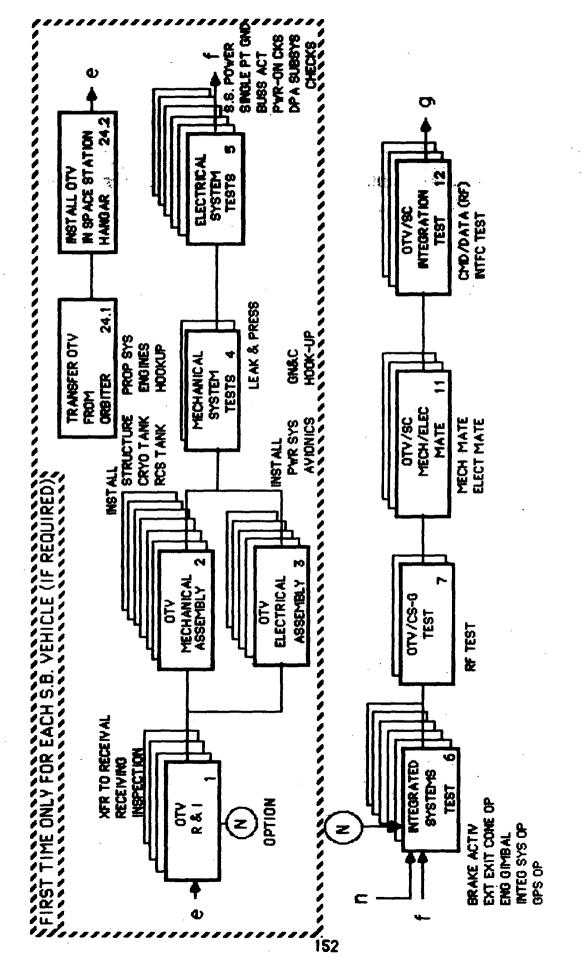
OTV STORAGE AND RETURN TO FLOW Task No: 39 Subtask No: < 39.0300> Description: <REMOVE SEAL Hazard Level(*): 1 None Activity: REMOVE SEALS INSTALLED ON OTV Personnel: **Control Station Vehicle** Payload Specialist(s) ø) e) Engineering 0) Shop 8 Inspector 1) e) Other Sub Total-6). Total-Serial Time To Complete: Total Manhours (60 min Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: Air Lock: Ø [W/D/H][ft] @ Ton 0 Ft.Hook Height 0 ø W/H][ft Doors: A A High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA E.C.S: Humidity: Temperature: Cleanliness: 100K 50 +/--5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y OIS: NA Commercial Telephone: Y RF System(+): N Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input RF System= A: S Band & C Band Fire Protection/Deluge= A: fire protection or B: deluge or 8: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

OTV STORAGE AND RETURN TO FLOW Task No: 39 Description: <REMOVE COVERS ON OTV Subtask No: < 39.0400> Hazard Level(*): 1 None Activity: REMOVE COVERS ON OTV Personnel: **Control Station** Vehicle Payload Specialist(s) Engineering 0) Shop 0) Inspector Other 0) Sub Total-6). Total-Serial Time To Complete: 60 min Total Manhours (6.0) Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: 0 0 0 [W/D/H][ft] Air Lock: Ø Ton 9 Ft.Hook Height ě [W/H][f̄t̄] a Doors: High Bay: 70 100 85 [W/D/H][ft] 0 Ton 0 Ft.Hook Height Standard Commercial Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/- 5 % 70 +/-Closed Circuit Television: NA Power Cutoff: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Shower/Eye Wash: NA Fire Protection/Deluge(+): A Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commercial Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canistèr: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Hazard Level:= 1: None Others:= Y: Yes or 2: Local Clear N: No NA: Not Applicable or 3: Area Clear or 4: Facility Clear TD: To Be Determined

Task No: 39 OTV STORAGE AND RETURN TO FLOW Description: <RETURN OTV TO FLOW Subtask No: < 39.0500> Hazard Level(*): 2 Local Clear Activity: PREPARE FOR INTEGRATED TEST. VERIFY ALL AVIONICS CONFIGURED FOR POWER APPLICATION Personnel: **Control Station** Vehicle Payload Specialist(s) O) e) e) Engineering 2) Shop 0) Inspector Other e) Sub Total-4) Total-Serial Time To Complete: 180 min 12.0) Total Manhours (Automation Need: (Primary Key) Automation Secondary Key(s) **Detailed Facility Resources** Physical Size: Crane Capacity: [W/D/H][ft] Air Lock: 0 0 0 Ton 0 **6 Ft.Hook Height** Doors: 0 [W/H][ft] High Bay: 70 100 85 [W/D/H][ft] 0 Ton **6** Ft.Hook Height Standard Commerical Power: Y Instrumentation Power [Uninterrupted]: NA Cleanliness: 100K E.C.S: Humidity: Temperature: 50 +/-70 +/-Power Cutoff: NA Closed Circuit Television: NA Facility GN2: NA Fuel/Oxidizer Disposal: N Helium Supply: NA Shop Air: NA Fire Protection/Deluge(*): A Shower/Eye Wash: NA Vacuum: NA Lightning Protection: Y Potable Water: NA Paging: Y Commerical Telephone: Y RF System(*): N OIS: NA Personnel Airlock: Y Grounding: Y Explosion Proof: NA **Detailed Equipment Resources** Special Tool Kit: NA Slings: NA OTV Adapter: NA Breakout Boxes: NA Adapter Cables: NA Ground Power Unit: NA Air Pallet: NA Work Stands: Y Special Hoisting Equip: NA NASA Canister: NA OTV Canister: NA (*) Legend For Data Input Fire Protection/Deluge= A: fire protection RF System= A: S Band & C Band or B: deluge or B: Ku Band or C: both or C: both or N: none or N: none Others:= Y: Yes Hazard Level:= 1: None or 2: Local Clear N: No or 3: Area Clear NA: Not Applicable or 4: Facility Clear TD: To Be Determined

APPENDIX C

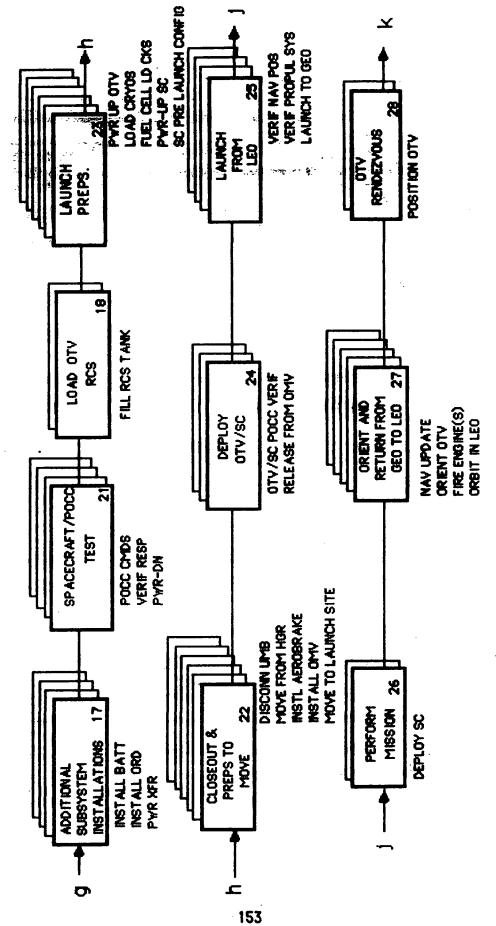
SPACE BASED ORBITAL TRANSFER VEHICLE FLOW

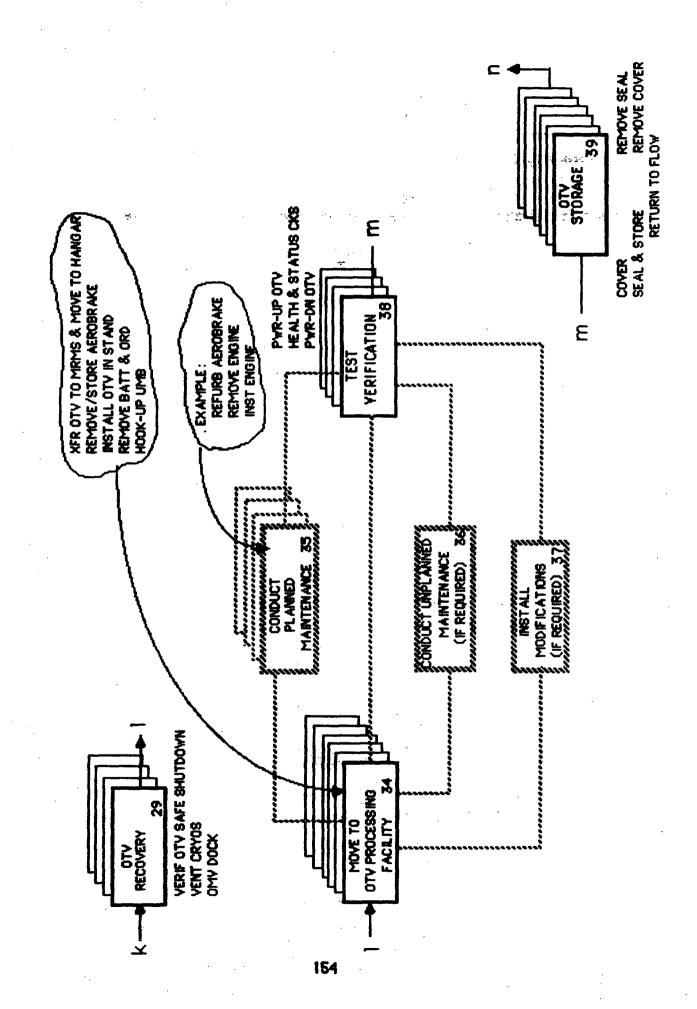


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FUNCTIONAL FLOW BLOCK IDENTIFICATION NUMBERS ARE CONSISTENT WITH THE FLOW FOR THE GROUND BASED PAYLOAD BAY CRYO CONFIGURATION. TASKS WITH DECIMAL NUMBERS ARE NEW FUNCTIONS ON THIS FLOW -- MISSING NUMBERS ARE G.B. OTV FUNCTIONS NOT REQUIRED FOR THE S.B. FLOW





APPENDIX D

SPACE BASED RESOURCE IDENTIFICATION SHEETS

SPACE BASE DETAILED RESOURCE IDENTIFICATION SHEET DESCRIPTION

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The following Space Based Resource Identification Sheets (RIS's) represent the tasks/subtasks associated with processing the OTV in the Space Station environment. The Space Based tasks are numbered 1 thru 39 as are the Ground Based RIS's, however only those tasks required for Space Based vehicle processing are included. The task/subtask numbers are identical for both Ground Based and Space Based activities that are the same to facilitate direct comparisons of requirements for the similar tasks. Any variance in the subtask numbering indicates a variance in the Space Based processing requirements.

The RIS for each subtask is divided into 4 sections; Personnel, Control System-Station, OTV Hangar, and Propellant Servicing Facility and Equipment.

The Personnel section details manpower requirements at either the Space Station (IVA or EVA) or the Ground Control Station. Along with the manning requirements is the serial time to complete the subtask and the computed total manhours. An entry is also made as to whether SC-POCC support is required. The Primary and Secondary keys associated with the Automation Technology Knowledge Base (ATKB) have not been keyed at this time.

The Control System-Station (CS-S) section details the support requirements of the specific subtask on the CS-S control system about the Space Station. The requirements include all the remote control capabilities required for the operations in the OTV hangar.

The OTV Hangar section details the facility requirements of the OTV hangar utilized for assembly and checkout of the Space Based OTV.

The Propellant Servicing Facility details the facility equipment required for propellant and fuel cell servicing of the OTV at the Space Station. Included in this section is the miscellaneous support equipment utilized for OTV processing.

It should also be noted that the Space Based RIS's are presented in Space Based OTV processing order which may or may not be in numerical sequence.

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 1 RECEIVING AND INSPECTION

SUBTASK NO: < 1.0400> DESCRIPTION: <TRANSFER TO RECEIVING ACTIVITY: REMOVE OTV AND COMPONENTS FROM ORBITER AND TRANSPORT TO ASSEMBLY PORT SPACE STATION **GROUND STATION** Personnel: STATION SPECIALIST(S) (0) IVA (CS-G STATION SPECIALIST(S) EVA Sub Total-Total-Serial Time To Complete: 240 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: Y ,Video: Y ,Telemetry: Y OTV HANGER REMOTE CONTROL: Door(s): Y ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: Y Paging: N MPAC: N Planning work station (computer): Y ** OTV HANGER ** Aerobrake storage fitting: N OTV flight support structure: N 1 Personnel EVA door: Y MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: Y ORU storage lockers: Y Tool lockers: Y Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ********************* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: Y EVA equipment box: Y Support Equipment: Y Portable MPAC: Y Lights: Y Bar code reader: Y Video Cameras: Y Tools manual/power: Y External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 1 RECEIVING AND INSPECTION

DESCRIPTION: <RECIEVING SUBTASK NO: < 1.0550> ACTIVITY: MANIFEST VERIFICATION, COMPONENT STORAGE AND LOCATION IDENTIFICATION **GROUND STATION** SPACE STATION Personnel: STATION SPECIALIST(S) IVA (
STATION SPECIALIST(S) EVA (CS-G (0) Sub Total-Total Serial Time To Complete: 300 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primory Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Data Dump: N Tracking: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): Y , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: Y Paging: Y Planning work station (computer): Y ****** OTV HANGER ** Aerobrake storage fitting: Y OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: Y Tool lockers: N Thermai control system: Y ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT *********** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: Y Lights: Y Bar code reader: Y Video Cameras: Y Tools manual/power: N External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

SUBTASK NO: < 2.0100> DESCRIPTION: <INSTALL ASSEMBLY STRUCTURE ACTIVITY: USING THE MRMS AND THE HPA, MOVE THE OTV ASSEMBLY INTO THE WORKSTAND INSPECT GUIDEPINS AND WORKSTAND ATTACH POINTS GROUND STATION SPACE STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-2) Total Serial Time To Complete: 960 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): Y , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: Y TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ********** OTV HANGER ****** Aerobrake storage fitting: N OTV flight support structure: Y Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: Y ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects. Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: Y Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

SUBTASK NO: < 2.0200> DESCRIPTION: < INSTALL CRYO TANK SET ACTIVITY: MOVE TANK SET IN TO POSITION, INSPECT DISCONNECT GUIDE PINS AND STRUCTURE ATTACH POINTS, SECURE, SAFE AND VERIFY. **GROUND STATION** SPACE STATION STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G (0) Sub Total-Total-Serial Time To Complete: 300 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* CONTROL SYSTEM - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): N OTV HANGER Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: Y Tool lockers: N Thermal control system: Y ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ********* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personne! equipment: N EVA equipment box: N Support Equipment: Y Portable MPAC: N Lights: Y Bar code reader: N Video Cameras: Y Tools manual/power: N External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

SUBTASK NO: < 2.0300> DESCRIPTION: <INSTALL RCS TANK SET ACTIVITY: IMPLEMENT SAFTY PROCEDURE-REMOVE TANK SET FROM STORAGE SITE, INSPECT, REMOVE PORTECTIVE COVER/DEVICES, INSTALL IN ASSEMBLY STRUCTURE, SECURE AND SAFE : SPACE STATION STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) GROUND STATION Personnel: (0) CS-G Sub Total-2). Total Serial Time To Complete: 360 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ******* OTV HANGER ************ Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: Y Tool lockers: N Thermal control system: Y ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: Y Portable MPAC: N Lights: Y Bar code reader: Y Video Cameras: Y Tools manual/power: N External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

DESCRIPTION: <INSTL PROPL SYS PLMB & CONTROL> SUBTASK NO: < 2.0400> ACTIVITY: USING MRMS AND HPA, MOVE AND ALIGN COMPONENTS INTO PLACE AND INSTALL PER PROCEDURES. GROUND STATION SPACE STATION Personnel: STATION SPECIALIST(S) IVA (2) CS-G (0) STATION SPECIALIST(S) EVA (0) Sub Total-Total Serial Time To Complete: 480 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N **EVA MONITOR:** Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y *** OTV HANGER **** Aerobrake storage fitting: N OTV flight support structure: Y Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: Y Tool lockers: N Thermal control system: Y PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: Y Portable MPAC: N Lights: Y Bar code reader: N Video Cameras: Y Tools manual/power: N External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

SUBTASK NO: < 2.0500> DESCRIPTION: <INSTALL RCS/ENGINES ACTIVITY: INSTALL RCS NOZZLES AND ENGINES SPACE STATION **GROUND STATION** Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G . (0) Sub Total-Total-Serial Time To Complete: 480 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ************** OTV HANGER ******************************** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: Y Tool lockers: N Thermal control system: Y ******** PROPELLANT SERVICING FACILITY AND EQUIPMENT ********* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fili/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: Y Portable MPAC: N Lights: Y Bar code reader: N Video Cameras: Y Tools manual/power: N External ORU storage boxes: Y

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SUBTASK NO: < 3.0200> DESCRIPTION: <INSTALL POWER SYSTEM ACTIVITY: ATTACH ELECTRICAL POWER SYSTEM TO THE MRMS OR HPA. ALIGN GUIDE PINS AND ATTACH POINTS. INSTALL, SECURE, AND SAFE. SPACE STATION GROUND STATION Personnel: STATION SPECIALIST(S) IVA (2) CS-G (0) STATION SPECIALIST(S) EVA (0) Sub Total-2) Total-Serial Time To Complete: 480 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ***** - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N , Video: N , Telemetry: N. OTY HANGER REMOTE CONTROL: Door(s): N ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ************************** OTV HANGER ****** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: Y MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: Y Tool lockers: N Thermal control system: Y ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT **************** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: Y Portable MPAC: N Lights: Y Bar code reader: N Video Cameras: Y Tools manual/power: N External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

SUBTASK NO: < 3.0300> DESCRIPTION: <INSTALL GN&C SYSTEM ACTIVITY: ATTACH MRMS OR HPA TO GN&C. MOVE GN&C INTO POSITION, INSPECT GUIDE PINS AND INTERFACE, LIFT INTO POSITION INSTALL, SECURE AND SAFE. GROUND STATION SPACE STATION STATION SPECIALIST(S) CS-G STATION SPECIALIST(S) EVA (0) Sub Total Total Serial Time To Complete: 240 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* CONTROL SYSTEM - STATION (CS-S) ** Data Dump: N OTV Control & monitor system: N Tracking: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y *** OTV HANGER ****** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: Y Tool lockers: N Thermal control system: Y ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ******* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: Y Portable MPAC: N Lights: Y Bar code reader: N Video Cameras: Y Tools manual/power: N External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

DESCRIPTION: <INSTALL AVIONICS SYSTEM SUBTASK NO: < 3.0400> ACTIVITY: ATTACH MANS OR HPA TO THE AVIONICS SYSTEM, INSPECT GUIDE PINS ATTACH POINTS AND INTERFACE, LIFT TO POSITION, INSTALL, SECURE AND SAFE. SPACE STATION GROUND STATION STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total-Total Manhours (Serial Time To Complete: 240 min SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) * OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ***** OTV HANGER **** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: Y Tool lockers: N Thermal control system: Y PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects,
Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: Y Portable MPAC: N Lights: Y Bar code reader: N Video Cameras: Y Tools manual/power: N External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

SUBTASK NO: < 4.0100> DESCRIPTION: < LEAK AND PRESSURE CHECKS ACTIVITY: VERIFY PLUMBING CONNECTIONS, CONFIGURE N2 SYSTEM, PRESSURIZE TANK SET PLUMBING, PROPULSION SYSTEM PLUMBING. SPACE STATION GROUND STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total-Serial Time To Complete: 1380 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: Y RR Umbilical control: Y TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ******* PROPELIANT SERVICING FACILITY AND EQUIPMENT ************** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SUBTASK NO: < 5.0150> DESCRIPTION: <SPACE STATION POWER ACTIVATION> ACTIVITY: POWER ON SPACE STATION POWER UNIT PER PROCEDURE. VERIFY POWER PROFILE SPACE STATION **GROUND STATION** Personnel: STATION SPECIALIST(S) IVA (2) (0) CS-G STATION SPECIALIST(S) EVA (0) Sub Total-Total-Serial Time To Complete: 240 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) ** Tracking: N OTV Control & monitor system: N Data Dump: N. EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: Y ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects,
Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N

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External ORU storage boxes: N

SUBTASK NO: < 5.0200>

DESCRIPTION: <SINGLE POINT GROUND CHECKS

ACTIVITY: PERFORM SINGLE POINT GROUND CHECKS

SPACE STATION **GROUND STATION** Personnel: CS-G

STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0)

Sub Total-

Total-

(0)

Serial Time To Complete: 180 min

Total Manhours (

SC-POCC Support Required: (N)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** CONTROL SYSTEM - STATION (CS-S) **

OTV Control & monitor system: N Tracking: N Data Dump: N

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N , Lights: Y FSS latch/unlatch: Y TV(signature data auto scan): Y

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

On-board: N ,Up-link: N

MRMS teleoperation control: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y ** OTV HANGER ***

Aerobrake storage fitting: N

MPAC connection: N

Personnel EVA door: N

HPA's (local & teleoperated): N

Hand & foot restraints: N

OTV flight support structure: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: Y

***** PROPELLANT SERVICING FACILITY AND EQUIPMENT ********

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects,
Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: Y

Bar code reader: N

Video Cameras: Y

Tools manual/power: N

External ORU storage boxes: N

SUBTASK NO: < 5.0300> DESCRIPTION: <ACTIVATE POWER/ESSENTIAL BUS > ACTIVITY: POWER ON THE POWER BUS AND VERIFY POWER PROFILE. POWER ON THE ESSENTIAL BUS AND VERIFY POWER PROFILE. SPACE STATION GROUND STATION STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total-Serial Time To Complete: 60 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTY HANGER REMOTE CONTROL: Door(*): N ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N Prop. load & drain computer system: N OMV support: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ****** OTV HANGER ***** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: Y ****** PROPELIANT SERVICING FACILITY AND EQUIPMENT ********** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA equipment box: N Support Equipment: N EVA Personnel equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N

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SUBTASK NO: < 5.0400> DESCRIPTION: <AVIONICS POWER ON CHECKS ACTIVITY: APPLY OTV AVIONICS BUS POWER AND VERIFY THE POWER PROFILE. SPACE STATION GROUND STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total-Serial Time To Complete: 180 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ******* OTV HANGER ***** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ***** PROPELLANT SERVICING FACILITY AND EQUIPMENT **** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects. Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N

External ORU storage boxes: N

SUBTASK NO: < 5.0500> DESCRIPTION: < DPA SUBSYSTEM CHECKOUT ACTIVITY: VERIFY ALL AVIONICS ARE ON AND TELEMETRY MEASUREMENTS ARE PROPER AT THE SPACE STATION AND GROUND. GROUND STATION SPACE STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total Total Manhours (Serial Time To Complete: 30 min SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) ** OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N Tool lockers: N ORU storage lockers: N Thermal control system: N ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ********* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SUBTASK NO: < 6.0100> DESCRIPTION: <AEROBRAKE CONTROL CHECKS ACTIVITY: PERFORM AEROBRAKE CHECKS TO VERIFY PROPER OPERATION OF ALL COMPONENTS **GROUND STATION** SPACE STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total Serial Time To Complete: 240 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: N Data Dump: Y **EVA MONITOR:** Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y RR Umbilical control: N FSS latch/unlatch: Y TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y Planning work station (computer): Y ******* OTV HANGER **** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N
Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION INTEGRATED SYSTEM TEST TASK NO:

SUBTASK NO: < 6.0200>

DESCRIPTION: <EXTENDABLE ENGINE CONE CHECKS >

ACTIVITY: EXTEND/RETRACT EEC-VERIFY ALL COMPONENTS ARE OPERATING PROPERLY

Personnel: SPACE STATION

STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (8)

GROUND STATION CS-G (6)

Sub Total-

Total-

Serial Time To Complete:

60 min

Total Manhours (8.0)

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** - STATION (CS-S) *

OTV Control & monitor system: Y

Tracking: N

Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTY HANGER REMOTE CONTROL:

Door(s): N , Lights: Y FSS latch/unlatch:

TV(signature data auto scan): Y

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

On-board: N .Up-link: N

MRMS teleoperation control: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y

***** OTV HANGER ******

OTV flight support structure: N

Aerobrake storage fitting: N

MPAC connection: N

HPA's (local & teleoperated): N

Hand & foot restraints: N

ORU storage lockers: N

Personnel EVA door: N

Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N

Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

DESCRIPTION: < ENGINE GIMBLE CHECKS SUBTASK NO: < 6.0300> ACTIVITY: CONFIGURE GPS/OTV GSE AND TRANSMISSION SYSTEM, TRANSMIT COMMAND (Ku-BAND CLR) GROUND STATION SPACE STATION Personnel: STATION SPECIALIST(S) IVA CS-G STATION SPECIALIST(S) EVA (0) Sub Total-Total-Serial Time To Complete: 120 min 16.0) Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y **** OTV HANGER ** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermai control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SUBTASK NO: < 6.0400> DESCRIPTION: <INTEGRATED SYSTEM CHECKS ACTIVITY: CONFIGURE GPS/OTV GSE AND TRANSMISSION SYSTEM. TRANSMIT COMMAND (Ku-BAND CLR) Personnel: SPACE STATION GROUND STATION STATION SPECIALIST(S) IVA (2) (6) CS-G STATION SPECIALIST(S) EVA (0) Sub Total-Tatal-Serial Time To Complete: 1440 min Total Manhours (192.0) SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: Y FSS latch/unlatch: Y TV(signature data auto scan): Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y *** OTV HANGER ****** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: INTEGRATED SYSTEM TEST

SUBTASK NO: < 6.0500>

DESCRIPTION: <GPS OPERATION CHECKS

GROUND STATION

CS-G

ACTIVITY: CONFIGURE GPS/OTV/GSE AND TRANSMISSION SYSTEM

SPACE STATION Personnel:

STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0)

Sub Total-

Total

Serial Time To Complete: 120 min

Total Manhours (

(6)

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

******** CONTROL SYSTEM - STATION (CS-S) **

OTV Control & monitor system: Y

Tracking: N

Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: Y FSS latch/unlatch: Y

TV(signature data auto scan): Y

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

On-board: N ,Up-link: N

MRMS teleoperation control: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y **** OTV HANGER ********

OTV flight support structure: N

Personnel EVA door: N

MPAC connection: N

HPA's (local & teleoperated): N

Aerobrake storage fitting: N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ********

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

EVA Personnel equipment: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: OTV/CS-G TEST

SUBTASK NO: < 7.0100>

DESCRIPTION: <OTVCS RF TEST

ACTIVITY: CONFIGURE OTV/GPS/GSE AND TRANSMISSION SYSTEM, TRANSMIT COMMANDS

SPACE STATION

STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0)

GROUND STATION CS-G

Sub Total-

Total-

Serial Time To Complete: 960 min

Total Manhours (128.0)

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

******* - STATION (CS-S)

OTV Control & monitor system: Y Tracking: N Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: Y

TV(signature data auto scan): Y

FSS latch/unlatch: RR Umbilical control: N

TRAINING VIDEO SYSTEM:

MRMS teleoperation control: N

On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y

********** OTV HANGER *****

OTV flight support structure: N

Personnel EVA door: N

MPAC connection: N

HPA's (local & teleoperated): N

Aerobrake storage fitting: N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

****** PROPELLANT SERVICING FACILITY AND EQUIPMENT **********

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 11 OTV SPACECRAFT MATE

SUBTASK NO: < 11.0100> DESCRIPTION: MECHANICALLY MATE OTV TO SC ACTIVITY: USING SPACECRAFT, ADAPTER HARDWARE AND HANDLING EQUIPMENT MECHANICALLY MATE OTV AND SPACECRAFT. SPACE STATION GROUND STATION Personnel: STATION SPECIALIST(S) IVA (
STATION SPECIALIST(S) EVA (CS-G Sub Total-Total Serial Time To Complete: 360 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) Data Dump: Y OTV Control & monitor system: Y Tracking: N EVA MONITOR: Audio: Y ,Video: Y ,Telemetry: Y OTV HANGER REMOTE CONTROL: Door(s): Y ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: Y Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ****** OTV HANGER ***** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: Y. MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: Y ORU storage lockers: N Tool lockers: N Thermal control system: N ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ******** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: Y Support Equipment: N EVA equipment box: Y Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION OTV SPACECRAFT MATE

TASK NO: 11

DESCRIPTION: <ELECTRICALLY MATE OTV TO S/C >

ACTIVITY: VERIFY/CONNECT ALL S/C ELECTRICAL CABLES

SPACE STATION Personnel:

SUBTASK NO: < 11.0200>

STATION SPECIALIST(S) IVA (

GROUND STATION CS-G (6)

STATION SPECIALIST(S) EVA (2) Sub Total-

Total-

Serial Time To Complete: 240 min

36.9) Total Manhours (

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

***** - STATION (CS-S) *****

Tracking: N OTV Control & monitor system: Y Data Dump: Y

EVA MONITOR:

Audio: Y ,Video: Y ,Telemetry: Y

OTV HANGER REMOTE CONTROL:

Door(s): N , Lights: Y

TV(signature data auto scan): Y

RR Umbilical control: N FSS latch/unlatch: Y

TRAINING VIDEO SYSTEM:

On-board: N ,Up-link: N

MRMS teleoperation control: N

Handling and Postioning Aid (HPA) teleoperation: Y

OMV support: Y

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: Y

MPAC connection: N

HPA's (local & teleoperated): Y

Hand & foot restraints: Y

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnei equipment: Y

EVA equipment box: Y Support Equipment: Y

Portable MPAC: Y

Lights: Y

Bar code reader: Y

Video Cameras: Y

Tools manual/power: Y

External ORU storage boxes: Y

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 12 OTV SPACECRAFT INTEGRATION

SUBTASK NO: < 12.0500> DESCRIPTION: <CMD/DATA RF CHECKS

ACTIVITY: VERIFY TELEMETRY AND COMMAND RF LINKS TO OTV AND S/C

Personnel: SPACE STATION GROUND STATION
STATION SPECIALIST(S) IVA (2) CS-G (6)

STATION SPECIALIST(S) EVA (0)
Sub Total (2)

Total——(8)
Serial Time To Complete: 300 min Total Manhours (40.0

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

******* CONTROL SYSTEM - STATION (CS-S)

OTV Control & monitor system: Y Tracking: N Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: Y TV(signature data auto scan): Y

FSS latch/unlatch: Y RR Umbilical control: N

TRAINING VIDEO SYSTEM: MRMS teleoperation control: N

On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N Prop. load & drain computer system: N

ORU Bar code data base: N Paging: Y MPAC: N

Planning work station (computer): Y

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: N MPAC connection: N

HPA's (local & teleoperated): N Hand & foot restraints: N

ORU storage lockers: N Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N
Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N EVA equipment box: N Support Equipment: N

Portable MPAC: N Lights: N Bar code reader: N

Video Cameras: N Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION

OTY SPACECRAFT INTEGRATION TASK NO: 12 DESCRIPTION: <OTV S/C INTERFACE TEST SUBTASK NO: < 12.0600> ACTIVITY: VERIFY MECHANICAL/ELECTRICAL INTERFACES BETWEEN OTV AND S/C GROUND STATION SPACE STATION Personnel: CS-G STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) Sub Total-Total: Serial Time To Complete: 120 min Total Manhours (16.0) SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N .Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y OTY HANGER ***** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ************** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propeliant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Comerca: N Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 17 INSTALL BATTERIES AND ORDNANCE

SUBTASK NO: < 17.0200> DESCRIPTION: < INSTALL BATTERIES ACTIVITY: REMOVE THE ACCESSS PANELS-INSTALL BATTERIES-PERFORM THE BATTERY TEST PROCEDURE-CLOSE THE ACCESS PANELS SPACE STATION GROUND STATION STATION SPECIALIST(S) IVA (
STATION SPECIALIST(S) EVA (CS-G (6) Sub Total-Total-Serial Time To Complete: 180 min Total Manhours (24.0) SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ************ CONTROL SYSTEM - STATION (CS-S) ** OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ***** OTV HANGER ********* Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: Y ORU storage lockers: N Tool lockers: N Thermal control system: N PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: Y Portable MPAC: N Lights: Y Bar code reader: Y Video Cameras: Y Tools manual/power: Y External ORU storage boxes: Y SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 17 INSTALL BATTERIES AND ORDNANCE

SUBTASK NO: < 17.0300> DESCRIPTION: <INSTALL ORDNANCE ACTIVITY: REMOVE ACCESS PANELS-PERFORM STATIC VOLTAGE CHECKS-INSTALL ORDNANCE PERFORM STATIC VOLTAGE CHECKS-ELECTRICALLY CONNECT SQUIBS-REPLACE ACCESS PANELS SPACE STATION GROUND STATION Personnei: STATION SPECIALIST(S) IVA (CS-G (6) STATION SPECIALIST(S) EVA (Sub Total-2)-Total-Serial Time To Complete: 360 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) ** Tracking: N OTV Control & monitor system: Y Data Dump: Y. EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N .Lights: Y TV(signature data auto scan): Y RR Umbilical control: N FSS latch/unlatch: TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ***** OTV HANGER ******* Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: Y HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 17 INSTALL BATTERIES AND ORDNANCE

DESCRIPTION: <PERFORM POWER TRANSFER CHECKS > SUBTASK NO: < 17.0500> ACTIVITY: PERFORM OTV POWER ON TEST-TRANSFER POWER TO BATTERY POWER-PERFORM BATTERY POWER CHECKS-TRANSFER POWER TO SPACE STATION POWER. SPACE STATION **GROUND STATION** Personnei: STATION SPECIALIST(S) IVA (CS-G STATION SPECIALIST(S) EVA (Sub Total-Total-Serial Time To Complete: 120 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* CONTROL SYSTEM - STATION (CS-S) * OTV Control & monitor system: Y Tracking: N Data Dump: Y. EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y **** OTV HANGER ***** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ********* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 18 LOAD OTV RCS

SUBTASK NO: < 18.0200> DESCRIPTION: <FILL RCS TANKS ACTIVITY: VERIFY RCS MECHANICAL CONNECTIONS, COMMAND START OF FILL OPERATIONS-VERIFY PRESSURE/TEMP DATA. SPACE STATION **GROUND STATION** Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G (6) 2)-Sub Total-Total Serial Time To Complete: 120 min Total Manhours (16.0) SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******** CONTROL SYSTEM - STATION (CS-S) ** OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: TV(signature data auto scan): Y Door(s): N , Lights: Y FSS latch/unlatch: RR Umbilical control: Y TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N .Prop. load & drain computer system: Y ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ****** OTV HANGER ***** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ***** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): Y Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: Y Fuel cell fill/drain/purge/pressurization: Y Propeliant metering system: Y EVA Personnel equipment: N EVA equipment box: N Support Equipment: Y Portable MPAC: N Lights: Y Bar code reader: N Video Cameras: Y Tools manual/power: N External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 21 SPACECRAFT POCC TEST

SUBTASK NO: < 21.0100> DESCRIPTION: <ISSUE S/C COMMANDS FROM POCC > ACTIVITY: ISSUE COMMANDS FROM POCC VIA TDRSS-KSC TELEMETRY-ORBITER COMMAND AND DATA SYSTEM. **GROUND STATION** SPACE STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G (6) Sub Total-Total-Serial Time To Complete: 240 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: Y TV(signature data auto scan): Y RR Umbilical control: N FSS latch/unlatch: Y TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ********** OTV HANGER **** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 21 SPACECRAFT POCC TEST

SUBTASK NO: < 21.0200> DESCRIPTION: <VERIFY SPACECRAFT RESPONSE

ACTIVITY: VERIFY DATA INDICATES POCC IS ABLE TO ISSUE COMMANDS TO THE S/C

AND RECEIVE PROPER RESPONSE.

Personnel: SPACE STATION GROUND STATION
STATION SPECIALIST(S) IVA (2) CS-G (6)

STATION SPECIALIST(S) IVA (2)
STATION SPECIALIST(S) EVA (0)
Sub Total

2)—————(6) Total——(8)

MRMS teleoperation control: N

Serial Time To Complete: 120 min

Total Manhours (16.0)

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

OTV Control & monitor system: Y Tracking: N Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: Y TV(signature data auto scan): Y

FSS latch/unlatch: Y RR Umbilical control: N

TRAINING VIDEO SYSTEM:
On-board: N ,Up-link: N

on board. It top Tille. It

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N Prop. load & drain computer system: N

ORU Bar code data base: N Paging: Y MPAC: N

Planning work station (computer): Y

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: N MPAC connection: N

HPA's (local & teleoperated): N Hand & foot restraints: N

ORU storage lockers: N Tool lockers: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N EVA equipment box: N Support Equipment: N

Portable MPAC: N Lights: N

Lights: N Bar code reader: N

Video Cameras: N Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION

TASK NO: 21 SPACECRAFT POCC TEST SUBTASK NO: < 21.0300> DESCRIPTION: <POWER DOWN SPACECRAFT ACTIVITY: REMOVE SPACECRAFT POWER Personnel: SPACE STATION **GROUND STATION** STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total Total Serial Time To Complete: Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N

External ORU storage boxes: N

SUBTASK NO: < 22.0150> DESCRIPTION: «DISCONNECT UMBILICALS ACTIVITY: DEMATE AND INSPECT ELECTRICAL CONNECTORS, INSTALL PROTECTIVE COVERS/ DEVICES. ATTACH MRPS OR HPA TO OTV ASSEMBLY IN PREPS TO EXIT HANGAR. GROUND STATION SPACE STATION STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total-Serial Time To Complete: 720 min Total Manhours (96.0) SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* CONTROL SYSTEM - STATION (CS-S) *** OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: Y TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects. Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

DESCRIPTION: SMOVE FROM HANGAR SUBTASK NO: < 22.0250> ACTIVITY: USING THE MRMS AND HPA, MOVE THE OTV OUT OF THE HANGAR. MONITOR FOR CHANGE IN HEALTH PARAMETERS. POSITION OTV FOR AEROBRAKE INSTALLATION. GROUND STATION SPACE STATION STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total-Serial Time To Complete: 240 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: Y Data Dump: Y EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): Y ,Lights: Y FSS latch/unlatch: Y TV(signature data auto scan): Y RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y OTV flight support structure: Y Aerobrake storage fitting: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: Y PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SUBTASK NO: < 22.0350> DESCRIPTION: <INSTALL/DEPLOY AEROBRAKE ACTIVITY: INSTALL/DEPLOY AEROBRAKE SYSTEM ON THE OTV **GROUND STATION** SPACE STATION Personnel: STATION SPECIALIST(S) IVA (
STATION SPECIALIST(S) EVA (CS-G (6) 0 Sub Total-Total-Serial Time To Complete: 120 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: Y Data Dump: Y **EVA MONITOR:** Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N .Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ******* OTV HANGER **** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

DESCRIPTION: < INSTALL OMV ON THE OTV SUBTASK NO: < 22.0450> ACTIVITY: INSTALL ONV ON THE OTV-VERIFY ALL POSITION LATCHES ARE LOCKED AND SECURE. Personnel: SPACE STATION **GROUND STATION** STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total-Serial Time To Complete: 240 min Total Manhours (32.0) SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* - STATION (CS-S) OTV Control & monitor system: Y Tracking: Y Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: Y Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ************* OTV HANGER ****** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ******* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Comeras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION

TASK NO: 22 CLOSEOUT AND PREPS TO MOVE SUBTASK NO: < 22.0550> DESCRIPTION: SMOVE P/L & OMV TO LAUNCH SITE > ACTIVITY: COMMAND ONLY TO MOVE P/L TO LAUNCH AREA FOR LAUNCH PREPS VIA THE SPACE STATION CONTROL CENTER. SPACE STATION **GROUND STATION** Personnei: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) (6) CS-G Sub Total-Total-Serial Time To Complete: 240 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: Y Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N RR Umbilical control: N FSS latch/unlatch: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: Y Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ******** OTV HANGER **** Aerobrake storage fitting: Y OTV flight support structure: Y Personnel EVA door: Y MPAC connection: Y HPA's (local & teleoperated): Y Hand & foot restraints: Y ORU storage lockers: Y Too! lockers: Y Thermal control system: Y ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ******** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Comercs: N Tools manual/power: N

SC electrical/mechanical interface simulator: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION OTV/SC LAUNCH PREPS TASK NO: 23

SUBTASK NO: < 23.0100> DESCRIPTION: <APPLY POWER TO OTV

ACTIVITY: APPLY POWER TO OTV

Personnel: SPACE STATION **GROUND STATION** CS-G

STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0)

Sub Total-Total-

Serial Time To Complete:

Total Manhours (

Hand & foot restraints: N

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

******* - STATION (CS-S) **

OTV Control & monitor system: Y Tracking: Y Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTY HANGER REMOTE CONTROL:

Door(s): N ,Lights: N TV(signature data auto scan): N

FSS latch/unlatch: N RR Umbilical control: N

TRAINING VIDEO SYSTEM: MRMS teleoperation control: N

On-board: N ,Up-link: N

HPA's (local & teleoperated): N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: Y Prop. load & drain computer system: N

ORU Bar code data base: N Paging: Y MPAC: N

Planning work station (computer): Y ******** OTV HANGER ******

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: N MPAC connection: N

Tool lockers: N ORU storage lockers: N

Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ********

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnei equipment: N EVA equipment box: N Support Equipment: N

Portable MPAC: N Lights: N Bar code reader: N

Video Cameras: N Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION OTV/SC LAUNCH PREPS

TASK NO: 23

DESCRIPTION: <LOAD/MONITOR CRYO SUBTASK NO: < 23.0200>

ACTIVITY: LOAD CRYO AND MONITOR FOR PRESSURE AND VOLUME(INCLUDE FUEL CELLS)

GROUND STATION SPACE STATION Personnel:

STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (

Sub Total-

CS-G (6) 2)

Serial Time To Complete: 480 min

Total. Total Manhours (

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** - STATION (CS-S)

OTV Control & monitor system: Y Tracking: Y Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: N FSS latch/unlatch: N TV(signature data auto scan): N

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

MRMS teleoperation control: N On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: Y

Prop. load & drain computer system: Y

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y ********** OTV HANGER *****

OTV flight support structure: N

Aerobrake storage fitting: N

HPA's (local & teleoperated): N

MPAC connection: N

Personnel EVA door: N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): Y Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: Y

Fuel cell fill/drain/purge/pressurization: Y

Propeliant metering system: Y

EVA Personnel equipment: N

EVA equipment box: N

Support Equipment: Y

Portable MPAC: N

Lights: Y

Bar code reader: N

Video Cameras: Y

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 23 OTV/SC LAUNCH PREPS

DESCRIPTION: <ACTIVATE/LOAD FUEL CELLS SUBTASK NO: < 23.0300> ACTIVITY: TRANSFER LOAD FROM SPACE STATION TO OTV FUEL CELLS-VERIFY ALL LOAD **PARAMETERS** GROUND STATION SPACE STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G Sub Total-Total-Total Manhours (Serial Time To Complete: 120 min SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) ** Tracking: Y OTV Control & monitor system: Y Data Dump: Y. EVA MONITOR: "Video: N "Telemetry: N Audio: N OTV HANGER REMOTE CONTROL: TV(signature data auto scan): N Door(s): N ,Lights: N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: Y Prop. load & drain computer system: N ORU Bar code data base: N Paaina: Y MPAC: N Planning work station (computer): Y *** OTV HANGER **** Aerobrake storage fitting: N OTV flight support structure: N Personne! EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ********* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: Y Bar code reader: N Video Cameras: Y Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 23 OTV/SC LAUNCH PREPS

SUBTASK NO: < 23.0450>

DESCRIPTION: <APPLY POWER TO SPACECRAFT

GROUND STATION

ACTIVITY: APPLY POWER TO THE SPACECRAFT

SPACE STATION Personnei:

STATION SPECIALIST(S) IVA (
STATION SPECIALIST(S) EVA (

Sub Total-

CS-G

Total

Serial Time To Complete: 240 min

Total Manhours (32.0)

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** - STATION (CS-S) *

OTV Control & monitor system: Y

Tracking: Y

Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N , Lights: N FSS latch/unlatch: N TV(signature data auto scan): N

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

On-board: N ,Up-link: N

MRMS teleoperation control: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: Y

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y

*** OTV HANGER *****

Aerobrake storage fitting: N OTV flight support structure: N

MPAC connection: N

HPA's (local & teleoperated): N

Hand & foot restraints: N

ORU storage lockers: N

Personne! EVA door: N

Tool lockers: N

Thermal control system: N

****** PROPELLANT SERVICING FACILITY AND EQUIPMENT *******

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

EVA Personnel equipment: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 23 OTV/SC LAUNCH PREPS

SUBTASK NO: < 23.0550>

DESCRIPTION: <COMMAND S/C TO PRELAUNCH MODE >

ACTIVITY: SECURE SPACECRAFT SYSTEMS IN PRELAUNCH MODE

SPACE STATION GROUND STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G

Sub Total-

(6)

Serial Time To Complete: 30 min Total Manhours (

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** - STATION (CS-S)

OTV Control & monitor system: Y Tracking: Y Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: N FSS latch/unlatch: N

TV(signature data auto scan): N

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

MRMS teleoperation control: N

On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: Y

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y ******* OTV HANGER *****

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: N

MPAC connection: N

HPA's (local & teleoperated): N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N EVA equipment box: N Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION

TASK NO: 24 DEPLOY OTV/SPACECRAFT SUBTASK NO: < 24.0700> DESCRIPTION: <PERFORM POCC LAUNCH TESTS ACTIVITY: ISSUE COMMAND AND VERIFY OTV AND S/C READY FOR LAUNCH TO GEO SPACE STATION **GROUND STATION** Personnel: STATION SPECIALIST(S) IVA (
STATION SPECIALIST(S) EVA (CS-G (6) Sub Total-Total: Serial Time To Complete: 60 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* - STATION (CS-S) ** OTV Control & monitor system: Y Tracking: Y Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: Y Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y **** OTV HANGER ******* Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N **** PROPELLANT SERVICING FACILITY AND EQUIPMENT ****** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 24 DEPLOY OTV/SPACECRAFT

SUBTASK NO: < 24.0850> DESCRIPTION: CRELEASE OTV/SC FROM OMV ACTIVITY: RELEASE COMBINATION OTV AND SPACECRAFT IN LEG. RETURN THE OMY TO ITS PARKING HANGAR AT THE SPACE STATION. GROUND STATION SPACE STATION Personnel: IVA (STATION SPECIALIST(S) CS-G (6) STATION SPECIALIST(S) EVA (0 Sub Total-Total-Serial Time To Complete: 300 min Total Manhours (40.0) SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* - STATION (CS-S) ** OTV Control & monitor system: Y Tracking: Y Data Dump: Y EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: TV(signature data auto scan): N Door(s): N ,Lights: N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: Y Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y *** OTV HANGER ************** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ••••••• PROPELLANT SERVICING FACILITY AND EQUIPMENT ***************** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 25 LAUNCH FROM LEO

DESCRIPTION: <VERIFY NAV POSITION SUBTASK NO: < 25.0100> ACTIVITY: VERIFY POCC UPDATE IS RECEIVED AND NAV COMPUTER HAS UPDATED INFORMATION. SPACE STATION GROUND STATION Personnei: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) (6) CS-G Sub Total-2) Total Serial Time To Complete: 60 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Trackina: Y Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ******* OTV HANGER ***** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELIANT SERVICING FACILITY AND EQUIPMENT ******* PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION

TASK NO: 25

LAUNCH FROM LEO

SUBTASK NO: < 25.0200> DESCRIPTION: <VERIFY PROPULSION SYSTEM ACTIVITY: VERIFY TANK PRESSURES ARE NORMAL-VERIFY ENGINE CONTROL SPACE STATION GROUND STATION STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G

Sub Total-Serial Time To Complete: Total Manhours (60 min

SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S)

****** CONTROL SYSTEM - STATION (CS-S) **

Tracking: Y OTV Control & monitor system: Y Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N

TRAINING VIDEO SYSTEM: MRMS teleoperation control: N

On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N Prop. load & drain computer system: N

ORU Bar code data base: N Paging: Y MPAC: N

Planning work station (computer): Y *** OTV HANGER ****

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: N MPAC connection: N

HPA's (local & teleoperated): N Hand & foot restraints: N

ORU storage lockers: N Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N

EVA Personnel equipment: N EVA equipment box: N Support Equipment: N

Portable MPAC: N Lights: N Bar code reader: N

Tools manual/power: N Video Cameras: N

External ORU storage boxes: N

Propellant metering system: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 25 LAUNCH FROM LEO

DESCRIPTION: <LAUNCH TO GEO SUBTASK NO: < 25.0300> ACTIVITY: ISSUE COMMAND VIA POCC/OTVCS OR SPACE STATION TO LAUNCH TO GEO SPACE STATION **GROUND STATION** Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G (6) Sub Total Total-Serial Time To Complete: 240 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* - STATION (CS-S) OTV Control & monitor system: Y Tracking: Y Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y **** OTV HANGER **** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT *************** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Comerca: N Tools manual/power: N

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External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION PERFORM MISSION TASK NO: 26

SUBTASK NO: < 26.0100>

DESCRIPTION: <PACECRAFT

ACTIVITY: ISSUE COMMAND TO RELEASE THE SPACECRAFT IN GEO

Personnel: SPACE STATION

STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0)

GROUND STATION CS-G

Total-

Serial Time To Complete:

Sub Total

60 min

Total Manhours (

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

***** - STATION (CS-S) **

OTV Control & monitor system: Y

Tracking: N

Data Dump: Y

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: N FSS latch/unlatch: N

TV(signature data auto scan): N

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

MRMS teleoperation control: N

On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y *** OTV HANGER ****

Aerobrake storage fitting: N

OTV flight support structure: N

Personnel EVA door: N

MPAC connection: N

HPA's (local & teleoperated): N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 27 ORIENT AND RTN FROM GEO TO LEO

SUBTASK NO: < 27.0100> DESCRIPTION: <ISSUE NAV UPDATE ACTIVITY: POCC ISSUE NAV UPDATE-VERIFY COMPUTER RESPONDS TO NEW NAV DATA UPDATE. **GROUND STATION** Personnel: SPACE STATION STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) CS-G (6) Sub Total-Total-Total Manhours (Serial Time To Complete: 60 min SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ***** - STATION (CS-S) Data Dump: Y OTV Control & monitor system: Y Tracking: N **EVA MONITOR:** Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ***** OTV HANGER **** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA equipment box: N EVA Personnel equipment: N Support Equipment: N Portable MPAC: N Lights: N Bor code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION

TASK NO: 27 ORIENT AND RTN FROM GEO TO LEO SUBTASK NO: < 27.0200> DESCRIPTION: CORIENT OTV TO DE-ORBIT ACTIVITY: USING RCS, POSITION OTV FOR RETURN TO LEO GROUND STATION SPACE STATION Personnel: STATION SPECIALIST(S) IVA (2) CS-G STATION SPECIALIST(S) EVA (0) Sub Total-Serial Time To Complete: 60 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) * OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y **** OTV HANGER **** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ******************** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N

External ORU storage boxes: N SC electrical/mechanical inte

Video Cameras: N

SC electrical/mechanical interface simulator: N

Tools manual/power: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION

TASK NO: 27 ORIENT AND RTN FROM GEO TO LEO SUBTASK NO: < 27.0300> DESCRIPTION: <FIRE ENGINES ACTIVITY: VERIFY ENGINE FIRE UNDER COMPUTER CONTROL PER FLIGHT PROCEDURES Personnel: SPACE STATION GROUND STATION (6) STATION SPECIALIST(S) IVA (2) CS-G STATION SPECIALIST(S) EVA (Sub Total-2). Total-Serial Time To Complete: 60 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ************ CONTROL SYSTEM - STATION (CS-S) ** Tracking: N OTV Control & monitor system: Y Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N RR Umbilical control: N FSS latch/unlatch: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y *** OTV HANGER ***** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ***** PROPELIANT SERVICING FACILITY AND EQUIPMENT ******** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N

EVA Personnei equipment: N EVA equipment box: N Support Equipment: N

Portable MPAC: N Lights: N Bar code reader: N

Video Cameras: N Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 28 SPACESTATION AND OTV RENDEZOUS

DESCRIPTION: <POSITION OTV IN STANDOFF ORBIT> SUBTASK NO: < 28.0100> ACTIVITY: TRANSFER OTV TO RENDEZOUS ZONE. ESTABLISH STABLE ORBIT IN STANDOFF **POSITION** Personnel: SPACE STATION GROUND STATION STATION SPECIALIST(S) IVA (
STATION SPECIALIST(S) EVA (CS-G (6) Sub Total-Total-Serial Time To Complete: 240 min Total Manhours (32.0) SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* CONTROL SYSTEM - STATION (CS-S) ***** OTV Control & monitor system: Y Tracking: Y Data Dump: Y EVA MONITOR: Audio: N ,Video: N ,Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y OTY HANGER **** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION FASK NO: 29 OTV RECOVERY

TASK NO: 29 OTV RECOVERY

SUBTASK NO: < 29.0100> DESCRIPTION: <RETRACT EEC, VERIFY OTV SAFE >

ACTIVITY: ISSUE COMMANDS TO RETRACT THE EEC. SHUTDOWN/SAFE OTV FOR RECOVERY.

Personnel: SPACE STATION GROUND STATION
STATION SPECIALIST(S) IVA (2)
STATION SPECIALIST(S) EVA (0)

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

OTV Control & monitor system: Y Tracking: Y Data Dump: Y.

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: N TV(signature data auto scan): N

FSS latch/unlatch: N RR Unbilical control: N

TRAINING VIDEO SYSTEM: MRMS teleoperation control: N

On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N Prop. load & drain computer system: N

ORU Bar code data base: N Paging: Y MPAC: N

Planning work station (computer): Y

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: N MPAC connection: N

HPA's (local & teleoperated): N Hand & foot restraints: N

ORU storage lockers: N Tool lockers: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N
Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N
Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N EVA equipment box: N Support Equipment: N

Portable MPAC: N Lights: N Bar code reader: N

Video Cameras: N Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 29 OTV RECOVERY

DESCRIPTION: <VENT OTV CRYO SYSTEM SUBTASK NO: < 29.0200> ACTIVITY: ISSUE COMMANDS TO CONFIGURE CRYO SYSTEM FOR VENT OPERATIONS. VENT THE OTV CRYO SYSTEM. GROUND STATION SPACE STATION Personnel: STATION SPECIALIST(S) IVA CS-G STATION SPECIALIST(S) EVA (Sub Total-Total-32.0) Serial Time To Complete: 240 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) * OTV Control & monitor system: Y Tracking: Y Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y **** OTV HANGER *** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT **************** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 29 OTV RECOVERY

SUBTASK NO: < 29.0300> DESCRIPTION: <OTV CAPTURE ACTIVITY: MOVE THE OMY FROM ITS STORAGE HANGER TO THE OTV SAFETY ZONE. DOCK AND CAPTURE THE OTV. VERIFY OTV/OMV DOCK AND LATCH. GROUND STATION SPACE STATION STATION SPECIALIST(S) IVA (2) CS-G STATION SPECIALIST(S) EVA (Sub Total-Total Total Manhours (Serial Time To Complete: 60 min SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ***** - STATION (CS-S) OTV Control & monitor system: Y Tracking: Y Data Dump: Y EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: N TV(signature data auto scan): N FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: Y Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y **** OTV HANGER ***** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propeliant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N . Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 34 MOVE TO PROCESSING FACILITY

TASK NO: 34 MOVE TO PROCESSING FACILITY SUBTASK NO: < 34.0150> DESCRIPTION: <USE MRMS TO MOVE OTV INTO HGR > ACTIVITY: POWER DOWN THE OTV. OPEN HANGAR AND PREPARE TO MOVE THE OTV INTO THE HANGER AND POSITION FOR INSTALLATION INTO WORKSTAND. GROUND STATION SPACE STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) (0) Sub Total-Total-Serial Time To Complete: 300 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: Y Tracking: Y Data Dump: N **EVA MONITOR:** Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): Y ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: N RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y Aerobrake storage fitting: Y OTV flight support structure: Y Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): Y Hand & foot restraints: N ORU storage lockers: Y Tool lockers: Y Thermal control system: Y ******** PROPELLANT SERVICING FACILITY AND EQUIPMENT ******** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N Support Equipment: N EVA Personnel equipment: N EVA equipment box: N

Portable MPAC: N Lights: N Bar code reader: N

Video Cameras: N Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 34 MOVE TO PROCESSING FACILITY

SUBTASK NO: < 34.0250> DESCRIPTION: <REMOVE AND STORE AEROBRAKE ACTIVITY: USING THE SPECIAL TOOL KIT, PERFORM THE EVALTO REMOVE AND STORE THE AEROBRAKE. SPACE STATION GROUND STATION Personnel: STATION SPECIALIST(S) IVA (1) STATION SPECIALIST(S) EVA (2) CS-G (0) Sub Total-Total-Serial Time To Complete: 720 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Pringry Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) OTV Control & monitor system: N Tracking: Y Data Dump: N EVA MONITOR: Audio: Y ,Video: Y ,Telemetry: Y OTV HANGER REMOTE CONTROL: Door(s): N .Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: Y Planning work station (computer): Y ********** OTV HANGER ***** Aerobrake storage fitting: Y OTV flight support structure: Y Personnel EVA door: Y MPAC connection: Y HPA's (local & teleoperated): Y Hand & foot restraints: Y ORU storage lockers: Y Tool lockers: Y Thermal control system: Y ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ********** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: Y Support Equipment: N EVA equipment box: Y Bar code reader: N Portable MPAC: N Lights: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 34 MOVE TO PROCESSING FACILITY

SUBTASK NO: < 34.0300>

DESCRIPTION: <INSTALL OTV IN WORKSTAND

ACTIVITY: INSTALL/SECURE OTV IN THE OTV WORKSTAND

SPACE STATION Personnel:

STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0)

Sub Total-

GROUND STATION CS-G

Total

Serial Time To Complete: 240 min

Total Manhours (

SC-POCC Support Required: (N)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** - STATION (CS-S) **

OTV Control & monitor system: N

Tracking: N

Data Dump: N

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: Y FSS latch/unlatch:

TV(signature data auto scan): Y

RR Umbilical control: Y

TRAINING VIDEO SYSTEM:

On-board: N ,Up-link: N

MRMS teleoperation control: Y

Handling and Postioning Aid (HPA) teleoperation: Y

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y

* OTV HANGER ****

Aerobrake storage fitting: N OTV flight support structure: N

HPA's (local & teleoperated): N

MPAC connection: N

Personnel EVA door: N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ********************

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N

Remote Control Remateable Quick Disconnects.

Fill/drain/vent/pressurization: N

Fuel cell fili/drain/purge/pressurization: N

Propeliant metering system: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

EVA Personnel equipment: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 34 MOVE TO PROCESSING FACILITY

SUBTASK NO: < 34.0400> DESCRIPTION: <REMOVE BATTERIES AND ORDNANCE > ACTIVITY: REMOVE BATTERY ACCESS PANELS AND REMOVE BATTERIES. REMOVE ALL UNUSED **ORDNANCE** SPACE STATION **GROUND STATION** Personnel: STATION SPECIALIST(S) IVA (STATION SPECIALIST(S) EVA (CS-G (0) Sub Total-2) Total-Serial Time To Complete: 188 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* CONTROL SYSTEM - STATION (CS-S) ** OTV Control & monitor system: N Trackina: N Data Dump: N **EVA MONITOR:** Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: TV(signature data auto scan): Y RR Umbilical control: Y Door(s): N .Lights: Y FSS latch/unlatch: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N .Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ****** OTV HANGER ********* Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N Support Equipment: N EVA Personnel equipment: N EVA equipment box: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION MOVE TO PROCESSING FACILITY TASK NO: 34

SUBTASK NO: < 34.0550>

DESCRIPTION: <CONNECT UMBILICALS

ACTIVITY: MATE ALL UMBILICAL CONNECTIONS IN PREPARATION FOR OTV PROCESSING

SPACE STATION Personnel:

STATION SPECIALIST(S) IVA

STATION SPECIALIST(S) EVA (Sub TotalGROUND STATION CS-G

Serial Time To Complete: 300 min

Total Total Manhours (

10.0)

SC-POCC Support Required: (N)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** CONTROL SYSTEM - STATION (CS-S) *****

OTV Control & monitor system: N Tracking: N Data Dump: N

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N , Lights: Y FSS latch/unlatch: Y TV(signature data auto scan): Y

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

On-board: N ,Up-link: N

MRMS teleoperation control: Y

Handling and Postioning Aid (HPA) teleoperation: Y

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Planning work station (computer): Y * OTV HANGER *****

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: N

MPAC connection: N

HPA's (local & teleoperated): N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ********

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 35 CONDUCT PLANNED MAINTENANCE

DESCRIPTION: REFURBISH AEROBRAKE SYSTEM SUBTASK NO: < 35.0100> ACTIVITY: PERFORM MAINTENANCE AND REFURBISHMENT OF THE AEROBRAKE SYSTEM **GROUND STATION** SPACE STATION STATION SPECIALIST(S) IVA (STATION SPECIALIST(S) EVA (CS-G Sub Total-Total-Serial Time To Complete: 600 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* - STATION (CS-S) OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: Y TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ****** OTV HANGER *** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ***** PROPELLANT SERVICING FACILITY AND EQUIPMENT **** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 35 CONDUCT PLANNED MAINTENANCE

DESCRIPTION: <REMOVE ENGINE PUMPS AND STORE > SUBTASK NO: < 35.0200> ACTIVITY: REMOVE THE ENGINE/PUMP USING THE SPECIAL TOOL KIT AND ROUTE TO STORAGE AREA FOR RETURN TO EARTH FOR REPAIR AND REFURBISHMENT SPACE STATION **GROUND STATION** STATION SPECIALIST(S) IVA (STATION SPECIALIST(S) EVA (CS-G Sub Total-Total-Serial Time To Complete: 360 min Total Manhours (12.0) SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ***** CONTROL SYSTEM - STATION (CS-S) ***** OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): Y ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: Y TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y *** OTV HANGER *************** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT **************** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 35 CONDUCT PLANNED MAINTENANCE

SUBTASK NO: < 35.0300>

ACTIVITY: REINSTALL AND RETEST ENGINE/PUMPS **GROUND STATION** SPACE STATION Personnel: STATION SPECIALIST(S) IVA (2) STATION SPECIALIST(S) EVA (0) (0) CS-G Sub Total-Total Serial Time To Complete: 360 min Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* CONTROL SYSTEM - STATION (CS-S) ** OTV Control & monitor system: N Tracking: N Data Dump: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): Y ,Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: Y TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: Y OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ******* PROPELLANT SERVICING FACILITY AND EQUIPMENT ***************** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N SC electrical/mechanical interface simulator: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 36 CONDUCT UNPLANNED MAINTENANCE

SUBTASK NO: < 36.0100>

DESCRIPTION: <CONDUCT UNPLANNED MAINT

ACTIVITY: AS REQUIRED

SPACE STATION Personnel:

STATION SPECIALIST(S) IVA (0)

STATION SPECIALIST(S) EVA (Sub Total

GROUND STATION CS-G

Total

Serial Time To Complete:

0 min

Total Manhours (

SC-POCC Support Required: (N)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** - STATION (CS-S) *

OTV Control & monitor system: N

Tracking: N

Data Dump: N

EVA MONITOR:

Audio: N ,Video: N ,Telemetry: N

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: N FSS latch/unlatch: N TV(signature data auto scan): N

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

MRMS teleoperation control: N

On-board: N .Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: N MPAC: N

Planning work station (computer): Y

*** OTV HANGER ********

OTV flight support structure: N

Personnel EVA door: N

MPAC connection: N

HPA's (local & teleoperated): N

Aerobrake storage fitting: N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

****** PROPELLANT SERVICING FACILITY AND EQUIPMENT *******

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N

Remote Control Remateable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION INSTALL MODIFICATIONS TASK NO: 37

SUBTASK NO: < 37.0100>

DESCRIPTION: <INSTALL MODIFICATIONS

GROUND STATION

CS-G

ACTIVITY: AS REQUIRED

SPACE STATION Personnei:

STATION SPECIALIST(S) IVA

STATION SPECIALIST(S) EVA (Sub Total-

Total-

Serial Time To Complete:

0 min

Total Manhours (

SC-POCC Support Required: (N)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

************* CONTROL SYSTEM - STATION (CS-S)

OTV Control & monitor system: N

Tracking: N

Data Dump: N

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTY HANGER REMOTE CONTROL:

Door(s): N .Lights: Y FSS latch/unlatch: Y TV(signature data auto scan): Y

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

On-board: N ,Up-link: N

MRMS teleoperation control: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: N MPAC: N

Planning work station (computer): Y

************* OTV HANGER ***********

OTV flight support structure: N

Personnel EVA door: N

MPAC connection: N

HPA's (local & teleoperated): N

Aerobrake storage fitting: N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

. Propellant metering system: N

EVA Personnel equipment: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 38 RETEST VERIFICATION

SUBTASK NO: < 38.0100> DESCRIPTION: <APPLY POWER TO OTV ACTIVITY: APPLY POWER TO OTV-VERIFY POWER PROFILE TO INSURE MOD PACKAGE POWER REQUIREMENTS. SPACE STATION GROUND STATION Personnel: STATION SPECIALIST(S) IVA (
STATION SPECIALIST(S) EVA (CS-G Sub Total-Total Serial Time To Complete: 60 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** - STATION (CS-S) ** OTV Control & monitor system: N Trackina: N Data Dump: N. EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: RR Umbilical control: N TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y ***** OTV HANGER ********** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 38 RETEST VERIFICATION

SUBTASK NO: < 38.0200> DESCRIPTION: PERFORM OTV HEALTH CHECKS ACTIVITY: PERFORM OTV RETEST/REVERIFICATION TO VERIFY HEALTH AND STATUS OF OTV SPACE STATION **GROUND STATION** Personnel: STATION SPECIALIST(S) IVA (2) CS-G (6) STATION SPECIALIST(S) EVA (0 Sub Total-Total Serial Time To Complete: 60 min Total Manhours (SC-POCC Support Required: (Y) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ****** CONTROL SYSTEM - STATION (CS-S) ** Data Dump: Y OTV Control & monitor system: N Tracking: N EVA MONITOR: Audio: N , Video: N , Telemetry: N OTV HANGER REMOTE CONTROL: Door(s): N ,Lights: Y TV(signature data auto scan): Y RR Umbilical control: N FSS latch/unlatch: TRAINING VIDEO SYSTEM: MRMS teleoperation control: N On-board: N ,Up-link: N Handling and Postioning Aid (HPA) teleoperation: N OMV support: N Prop. load & drain computer system: N ORU Bar code data base: N Paging: Y MPAC: N Planning work station (computer): Y *** OTV HANGER *************** Aerobrake storage fitting: N OTV flight support structure: N Personnel EVA door: N MPAC connection: N HPA's (local & teleoperated): N Hand & foot restraints: N ORU storage lockers: N Tool lockers: N Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ****** PROPELLANT SERVICING FACILITY Standard Servicing Interface (remote latch/unlatch): N Remote Control Remoteable Quick Disconnects, Fill/drain/vent/pressurization: N Fuel cell fill/drain/purge/pressurization: N Propellant metering system: N EVA Personnel equipment: N EVA equipment box: N Support Equipment: N Portable MPAC: N Lights: N Bar code reader: N Video Cameras: N Tools manual/power: N External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 38 RETEST VERIFICATION

SUBTASK NO: < 38.0300>

DESCRIPTION: <REMOVE POWER FROM OTV

GROUND STATION

CS-G

ACTIVITY: REMOVE POWER FROM THE OTV

SPACE STATION Personnel:

STATION SPECIALIST(S) IVA STATION SPECIALIST(S) EVA

Sub Total-

Total

Serial Time To Complete:

Total Manhours (

SC-POCC Support Required: (Y)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** - STATION (CS-S)

OTV Control & monitor system: Y Data Dump: Y. Tracking: N

EVA MONITOR:

Audio: N , Video: N , Telemetry: N

OTV HANGER REMOTE CONTROL:

TV(signature data auto scan): Y RR Umbilical control: N Door(s): N ,Lights: Y

FSS latch/unlatch: Y

TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y

On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N Prop. load & drain computer system: N

ORU Bar code data base: N Paging: Y MPAC: N

Planning work station (computer): Y *********** OTV HANGER *********************

Aerobrake storage fitting: N

OTV flight support structure: N

Personnel EVA door: N

MPAC connection: N

HPA's (local & teleoperated): N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N ****** PROPELLANT SERVICING FACILITY AND EQUIPMENT ****************

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: N

EVA equipment box: N

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION OTV STORAGE AND RETURN TO FLOW TASK NO: 39

SUBTASK NO: < 39.0100>

DESCRIPTION: <COVER OTV

ACTIVITY: PLACE PROTECTIVE COVERS ON OTV

SPACE STATION Personnel:

STATION SPECIALIST(S) IVA (1) STATION SPECIALIST(S) EVA (2)

GROUND STATION CS-G (0)

Total

Serial Time To Complete: 60 min

Sub Total-

Total Manhours (

SC-POCC Support Required: (N)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** - STATION (CS-S)

OTV Control & monitor system: Y

Tracking: N

Data Dump: Y

EVA MONITOR:

Audio: Y ,Video: Y ,Telemetry: Y

OTV HANGER REMOTE CONTROL:

Door(s): N , Lights: Y FSS latch/unlatch: Y

TV(signature data auto scan): Y

RR Umbilical control: Y

TRAINING VIDEO SYSTEM:

On-board: N ,Up-link: N

MRMS teleoperation control: Y

Handling and Postioning Aid (HPA) teleoperation: Y

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: Y MPAC: N

Pianning work station (computer): Y ********* OTV HANGER *****

Aerobrake storage fitting: N

OTV flight support structure: N

Personnel EVA door: Y

MPAC connection: N

HPA's (local & teleoperated): N

Hand & foot restraints: Y

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,
Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: Y

EVA equipment box: Y

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION OTV STORAGE AND RETURN TO FLOW TASK NO: 39

SUBTASK NO: < 39.0200> DESCRIPTION: <SEAL/MONITOR OTV ACTIVITY: INSTALL SEALS ON OTV AND MONITOR FOR PROPER TEMP AND HUMIDITY

GROUND STATION SPACE STATION Personnel: STATION SPECIALIST(S) IVA (1) STATION SPECIALIST(S) EVA (2) CS-G Sub Total-Total-Serial Time To Complete: Total Manhours (SC-POCC Support Required: (N) AUTOMATION NEED: (Primary Key) AUTOMATION SECONDARY KEY(S) ******* CONTROL SYSTEM - STATION (CS-S) OTV Control & monitor system: Y Tracking: N Data Dump: Y EVA MONITOR:

Audio: Y ,Video: Y ,Telemetry: Y

OTV HANGER REMOTE CONTROL: Door(s): N , Lights: Y TV(signature data auto scan): Y FSS latch/unlatch: Y RR Umbilical control: Y

TRAINING VIDEO SYSTEM: MRMS teleoperation control: Y On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: Y

OMV support: N Prop. load & drain computer system: N

ORU Bar code data base: N Paging: N MPAC: N

Planning work station (computer): Y

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: Y MPAC connection: N

HPA's (local & teleoperated): N Hand & foot restraints: Y

ORU storage lockers: N Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects, Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: Y EVA equipment box: Y Support Equipment: N

Portable MPAC: N Lights: N Bar code reader: N

Video Cameras: N Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION OTV STORAGE AND RETURN TO FLOW TASK NO: 39

SUBTASK NO: < 39.0300>

DESCRIPTION: <REMOVE SEAL

ACTIVITY: REMOVE SEALS INSTALLED ON OTV

Personnel: SPACE STATION

STATION SPECIALIST(S) IVA STATION SPECIALIST(S) EVA (

GROUND STATION CS-G

Serial Time To Complete: 60 min Total-

Sub Total-

Total Manhours (

SC-POCC Support Required: (N)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

****** - STATION (CS-S)

OTV Contro! & monitor system: N Tracking: N

Data Dump: N

EVA MONITOR:

Audio: Y , Video: Y , Telemetry: Y

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: Y FSS latch/unlatch: N TV(signature data auto scan): N

RR Umbilical control: N

TRAINING VIDEO SYSTEM:

On-board: N ,Up-link: N

MRMS teleoperation control: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N

Prop. load & drain computer system: N

ORU Bar code data base: N

Paging: N MPAC: N

Planning work station (coaputer): Y ************** OTV HANGER *****

OTV flight support structure: N

Personnel EVA door: Y

MPAC connection: N

HPA's (local & teleoperated): N

Aerobrake storage fitting: N

Hand & foot restraints: N

ORU storage lockers: N

Tool lockers: N

Thermal control system: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: Y

. EVA equipment box: Y

Support Equipment: N

Portable MPAC: N

Lights: N

Bar code reader: N

Video Cameras: N

Tools manual/power: N

External ORU storage boxes: N

SPACE STATION DETAILED RESOURCES IDENTIFICATION TASK NO: 39 OTV STORAGE AND RETURN TO FLOW

SUBTASK NO: < 39.0400> DESCRIPTION: <REMOVE COVERS/RTN OTV TO FLOW >

ACTIVITY: REMOVE COVERS AND RETURN OTV TO PROCESSING FLOW

Personnel: SPACE STATION GROUND STATION
STATION SPECIALIST(S) IVA (1) CS-G (8)
STATION SPECIALIST(S) EVA (2)

Serial Time To Complete: 60 min T

Total Manhours (3.0)

SC-POCC Support Required: (N)

AUTOMATION NEED: (Primary Key)

AUTOMATION SECONDARY KEY(S)

OTV Control & monitor system: N Tracking: N Data Dump: N.

EVA MONITOR:

Audio: Y ,Video: Y ,Telemetry: Y

OTV HANGER REMOTE CONTROL:

Door(s): N ,Lights: Y TV(signature data auto scan): N

FSS latch/unlatch: N RR Umbilical control: N

TRAINING VIDEO SYSTEM: MRMS teleoperation control: N

On-board: N ,Up-link: N

Handling and Postioning Aid (HPA) teleoperation: N

OMV support: N Prop. load & drain computer system: N

ORU Bar code data base: N Paging: N MPAC: N

Planning work station (computer): Y

Aerobrake storage fitting: N OTV flight support structure: N

Personnel EVA door: Y MPAC connection: N

HPA's (local & teleoperated): N Hand & foot restraints: N

ORU storage lockers: N Tool lockers: N

PROPELLANT SERVICING FACILITY

Standard Servicing Interface (remote latch/unlatch): N Remote Control Remateable Quick Disconnects,

Fill/drain/vent/pressurization: N

Fuel cell fill/drain/purge/pressurization: N

Propellant metering system: N

EVA Personnel equipment: Y EVA equipment box: Y Support Equipment: N

Portable MPAC: N Lights: N Bar code reader: N

Video Cameras: N Tools manual/power: N

External ORU storage boxes: N